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ABSTRACT

Participation of U.S. adults in formal learning activities during the 1990s was examined by analyzing data from the 1991, 1995, and 1999 Adult Education Surveys that were part of the National Household Education Surveys Program. Overall, participation in adult education between 1991 and 1999 increased among all but one age group (35-44 years), all racial/ethnic groups, all education levels, all labor force groups, and all occupation groups (except those in professional or managerial positions). The groups that did not increase their participation rates had some of the highest participation rates in 1991 and constant rates of participation thereafter. However, more in-depth statistical analyses revealed that participation in work-related courses by Hispanics, individuals with lower levels of education, individuals with lower-status jobs, and individuals who are employed part time is lower than that of other groups. Adults with lower levels of education were also less likely to participate in nonwork-related courses, even after other factors were accounted for. Despite elimination of some inequalities, highly educated and high-status groups remained the main beneficiaries of adult education. A discussion of the survey methodology and data reliability is appended along with nine standard error and logistic regression tables. (Contains 48 references and 27 tables/figures.) (MN)

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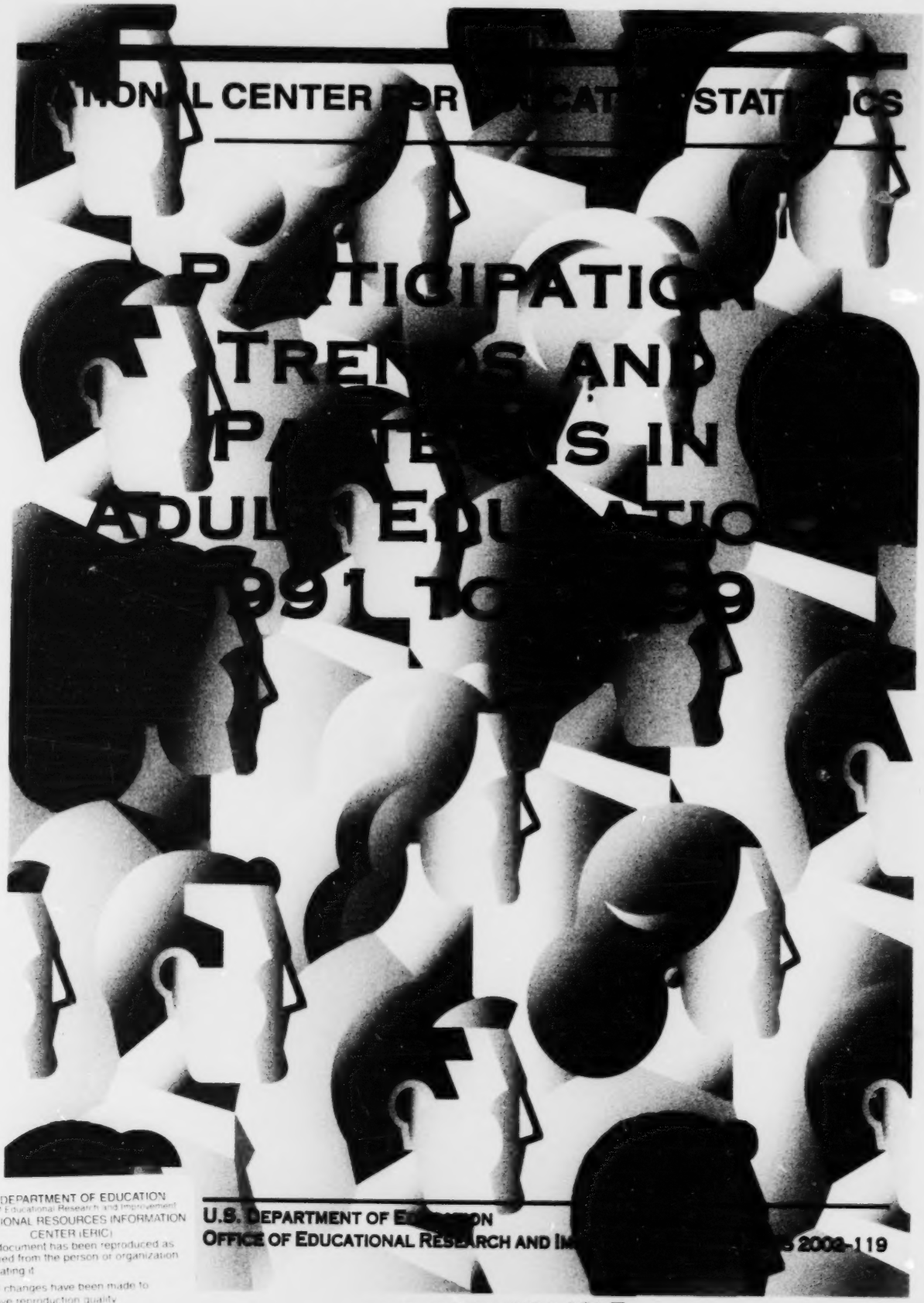

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Statistical Analysis Report February 2002

Participation Trends and Patterns in Adult Education: 1991 to 1999

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Executive Summary

This report provides an overview of adult participation in formal learning activities (courses and programs) during the 1990s, focusing on trends in participation over time and patterns of participation in 1999. The report replicates previous studies' findings of an overall increase in participation and (with some qualifications) differences in participation rates based on age, sex, race/ethnicity, education level, labor force status, and occupation group. The report extends these findings by examining trends over time in which groups of adults participate in adult education, and by providing a more detailed view of participation patterns in specific types of adult education, including the underlying determinants of these patterns.

The data for this report come from the 1991, 1995, and 1999 Adult Education Surveys conducted as part of the National Center for Education Statistics' National Household Education Surveys Program. In these surveys, adults were defined as all civilian, noninstitutionalized individuals age 16 or older who were not in elementary or secondary education at the time of the survey. Adult education activities included adult basic education and English as a Second Language (ESL) courses, apprenticeship programs, *some* programs leading to a formal (typically college) credential, courses taken for work-related reasons, and courses taken for reasons other than work (nonwork-related courses). Since the continuous pursuit of formal education is typically not considered adult education, in this report full-time participation in postsecondary credential programs by those ages 16–24 is not counted as an adult education activity.

The report examines trends and patterns of participation among the groups of adults listed in table A. Participation trends in adult education overall are examined from 1991 to 1999, and changes in participation in specific types of adult education are examined from 1995 to 1999. Patterns of participation in adult education among different groups of adults are also compared in 1991 and 1999. Finally, the report also uses multivariate statistical analyses to examine the determinants of participation for work-related courses and for nonwork-related courses in 1999. Some of the key questions addressed by this report are summarized below, along with the report's findings concerning each question.

Which adults increased their participation in adult education between 1991 and 1999?

The overall increase in participation in adult education between 1991 and 1999 was widespread, occurring among virtually every group of adults examined in this report. Specifically, participation rates increased among the following: all age groups except those ages 35–44, both men and women, all racial/ethnic groups, all education levels, all labor force groups, and all occupation groups except those in professional or managerial positions. The groups that did not increase their participation rates had some of the highest initial participation rates in 1991 and constant rates of participation thereafter.

Table A.—Summary of changes in participation patterns between 1991 and 1999, and 1999 patterns of participation in adult education

Group of adults	Change in participation between 1991 and 1999	1999 participation pattern
All adults	Increase in participation	Forty-six percent of adults participated.
Age		
16–24	Increase	Two oldest age groups (55–64 and 65 or older) participate at lower rates than younger age groups.
25–34	Increase	
35–44	No change	
45–54	Increase	
55–64	Increase	
65 or older	Increase	
Sex		
Male	Increase	Women participate at a higher rate than men.
Female	Increase	
Race/ethnicity		
White, non-Hispanic	Increase	No differences in participation rates between non-Hispanic whites and other racial/ethnic groups.
Black, non-Hispanic	Increase	
Hispanic	Increase	
Other minorities	Increase	
Education level		
Less than high school	Increase	Adults with higher levels of education participate at higher rates than adults with lower levels of education.
High school	Increase	
Some college	Increase	
Bachelor's degree or higher	Increase	
Labor force status		
Employed full time	Increase	Full-time workers participate at a higher rate than those who are retired or otherwise out of the labor force. Full-time workers participate at the same rate as part-time workers and the unemployed.
Employed part time	Increase	
Unemployed	Increase	
Not in labor force, not retired	Increase	
Retired	Increase	
Occupation group		
Professional and managerial	No change	Adults in higher status occupations participate at higher rates than those in lower status occupations. (Highest participation rate for professional and managerial; lowest rate for trades.)
Sales, service, and support	Increase	
Trades	Increase	

NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, participation in full-time credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991 and 1999.

Did the patterns of participation in adult education among various groups of adults change between 1991 and 1999?

Many participation patterns were the same in 1991 and 1999. In both years, adults with higher levels of education participated at higher rates than adults with lower levels of education; retired adults participated at a lower rate than those in all other labor force groups; and those in higher status occupations participated at higher rates than those in lower status occupations.

Changes in participation that did occur over time generally ameliorated differences among groups of adults. In 1991, younger and older adults participated at a lower rate than mid-aged adults, but in 1999 only older adults participated at a lower rate than those in other age groups. In 1991, non-Hispanic Blacks participated at a lower rate than non-Hispanic Whites, but in 1999, all minority groups participated at the same rate as non-Hispanic Whites. In 1991, full-time workers participated at a higher rate than all other adults, but in 1999, part-time and unemployed workers participated at the same rate as full-time workers; only those not in the labor force participated at a lower rate than full-time workers. There was only one situation in which participation rates became more disparate over time: In 1991, there was no difference in participation rates by sex, but in 1999, women participated at a higher rate than men.

In which types of adult education did adults increase their participation between 1995 and 1999?

Participation rates in specific types of adult education could not be examined for 1991, because the 1991 Adult Education Survey does not provide a comparable classification of education activities. Over the shorter time period between 1995 and 1999, participation rates increased overall and for all types of adult education except ESL programs and work-related courses, for which participation rates remained roughly level.

What are the patterns of participation in 1999 for each type of adult education activity?

Participation patterns vary, often in expected ways, among the four most common types of adult education (work-related courses, nonwork-related courses, adult basic education, and credential programs). Participation rates in adult basic education programs, for example, are highest among the youngest adults, those with the lowest levels of education, minorities, and those in nonprofessional and nonmanagerial occupations. Participation rates in credential programs, in contrast, tend to be higher among those with more education (up to "some college"), those in the labor force, those in professional or managerial occupations, and those with continuing education requirements.

Participation rates in the two most common learning activities, work-related courses and nonwork-related courses, are lower for the oldest adults, for Hispanics compared to non-Hispanic Whites, and for those with (rather than without) continuing education requirements. Participation also increases with education level and occupational status (with the lowest participation rate for those in the trades, a higher rate for those in sales, service or support occupations, and the highest rate for those in professional or managerial occupations). But participation in work-related courses also is lower for the youngest adults compared to mid-aged adults, and is higher for those employed full time compared to all other labor force groups. In comparison, participation rates in nonwork-related courses are higher among women than men and among those employed part time rather than full time.

What accounts for the 1999 participation patterns in the two most popular adult education activities, work-related courses and nonwork-related courses?

To answer this question, a series of logistic regression equations was performed, predicting participation from adults' demographic, education, and labor force characteristics. These analyses reveal the relationship of each of these adult characteristics to participation, independently of other adult characteristics.

Age. The finding that the youngest adults (ages 16–24) participate in work-related courses at a lower rate than mid-aged adults (ages 35–44) does not appear to be due to age differences in the employment characteristics of adults, as the participation difference remains when these characteristics are taken into account. It may be that employers are less likely to provide formal training to young workers compared to mid-aged workers, or that young adults have more current skills and thus less need to participate in work-related education. In contrast, adults ages 55–64 are less likely than mid-aged adults to participate in work-related education primarily because these older adults are less likely to be employed. It is less clear why adults age 65 or older participate in work-related courses at a relatively low rate. In accordance with human capital theory, these older adults may have less to gain from an investment in work-related education; however, among employed adults with the same level of income, adults age 65 or older participate in work-related education at the same rate as mid-aged adults, suggesting that differences in income and employment status also play a role. The lower participation rate of older adults (ages 55 or older) in nonwork-related courses does not appear to be due to education, labor force, or income differences, and may have more to do with the interests of older adults or the targeting of course offerings.

Sex. Women's higher participation rate in nonwork-related courses is not due to women having more time for these activities, by virtue of working part time or not at all; even after accounting for labor force status, women participate in these courses at a higher rate than men. When women and men with the same labor force status are compared, women also participate in work-related courses at a higher rate than men. Hypothetically, this sex difference in participation in both work-related courses and nonwork-related courses could result from women having a greater propensity to seek formal instruction or from a targeting of course offerings to women.

Race/ethnicity. Hispanics' lower participation rate in work-related courses is not entirely due to their education level, labor force status, occupation group, or income level; this difference remains even after accounting for these factors. Language barriers or specific occupational patterns that could not be detected in this study may account for this difference in participation rates. Hispanics' lower participation rate in nonwork-related courses appears to be related to their lower average education level; when education level is accounted for, Hispanics and non-Hispanic Whites participate in nonwork-related courses at the same rate.

Labor force status. Full-time workers participate in work-related courses at a higher rate than other adults regardless of age, sex, occupation group, income level, or continuing education status (i.e., whether or not the adult has continuing education requirements). This higher participation rate is probably motivated by labor market incentives that make work-related courses most available to and valuable for those employed full time. Participation rates in nonwork-related courses are higher not only among part-time workers (compared to full-time workers), but also—after accounting for other factors—among those who are retired or otherwise not in the labor force (compared to those who are employed). This difference in participation rates may arise from the greater amount of free time avail-

able to those who are employed part time or who are not in the labor force compared to those who are employed full time.

Occupation group. Participation in work-related courses is highest among those in professional and managerial occupations, even after accounting for education level and other factors; this may reflect a tendency by employers to provide more training to workers in these positions. Occupational differences in participation in nonwork-related courses are related to education level; after accounting for education level, those in professional and managerial jobs participate in nonwork-related courses at the same rate as other employed adults.

Education level and continuing education requirements. After accounting for other factors, those with higher levels of education and those with continuing education requirements participate in both work-related and nonwork-related courses at a higher rate than do (respectively) those with lower education levels and those who do not have continuing education requirements. A common motivation may underlie these findings; those who enjoy learning of all types may be more likely to continue their formal education, enter occupations that have continuing education requirements, and participate in nonwork-related courses. On the other hand, taking courses in one's post-high-school years, either to continue one's formal education or to meet continuing education requirements, may help foster an interest in other types of adult education.

Summary

The increase in participation in adult education found in this report is not new. What *is* new is evidence of the breadth of this increase. Virtually every group of adults examined increased their participation in adult education between 1991 and 1999, often in ways that reduced disparities in participation that had existed in 1991. But a closer look at participation in specific activities reveals some troubling signs of groups being left behind—especially Hispanics, those with lower levels of education, those with lower status jobs, and those who are employed part time. Even after accounting for other factors, all of these groups have relatively low rates of participation in work-related courses, an adult education activity that is likely to have economic payoffs. Adults with lower levels of education also are less likely than those with higher levels of education to participate in nonwork-related courses, after accounting for other factors. Thus, although the widespread increase in participation in adult education has been accompanied by an elimination of some inequities, in many cases the highly educated and high status groups that have been the traditional beneficiaries of adult education remain the main beneficiaries today.

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Chapter 1: Introduction

There has been increasing interest in recent years in adults' participation in learning activities, including adults going back to school, taking courses at work, and coursetaking for fun or personal interest. There are many reasons why more adults may be participating in educational activities now than in the past. For one thing, there are simply more adults than there have been before (U.S. Census Bureau 1999). Learning also may be more important in adults' lives now than in the past. A number of changes in the labor market have made continuous learning more critical for job success. But while the pressures for increased learning are well documented, data on adults' participation in education activities are scarce. This report uses data from a national survey of adults, conducted by the National Center for Education Statistics (NCES) in 1991, 1995, and 1999, to examine recent trends in participation in adult education. The report also examines the nature and extent of participation in adult education as of 1999. In both cases, the report focuses on how participation in adult education varies depending on the type of learning activity engaged in (e.g., credential program, work-related course) and on the characteristics of adults.

Factors Affecting the Demand for Adult Learning

One of the key changes affecting the demand for adult learning is the rapid labor market shift from a manufacturing economy to a service- and information-based economy. An important factor fueling this change is the growth of the "global economy," brought about through the internationalization of trade, production, and finance (Bills 2000). As a result of the liberalization of trade laws, individuals within a country not only compete among themselves for jobs but entire countries compete with each other for economic advantage in the world market. This global economy has resulted in the movement of certain industries and activities from advanced industrialized countries to less developed countries, and to an increasing amount of trade among these countries (Tovado 1994). Such trends are generally considered to have contributed to a shift within advanced industrialized countries (such as the United States) from manufacturing toward service-based economies.

Another important factor in this shift is technology. Although the role of technology in economic and industrial change is a topic of some debate (see Bollier 1998; Nelsen 2000), there does seem to be general agreement that new technologies such as the personal computer and other microelectronic information and control systems are transforming the world of work and contributing to the growth of an information-based economy within the United States.

This shift toward a service- and information-based economy, brought about by globalization and new technologies, has been accompanied by a corresponding shift in importance from natural resources and physical capital to human resources and human capital—that is, to the skills and abilities of the population. In a global information economy, the human capital embodied in a well-educated, adaptable

labor force becomes a country's most critical asset, which in turn places greater importance on both initial education and the continuing education of adults who have left the formal education system.[1]

Trends in the nature of jobs and in the adult population are also affecting the demand for adult learning. Not only has the distribution of jobs changed in recent years (from manufacturing to information-based services), so has the nature of jobs. Perhaps because society is currently in the midst of these changes, it is difficult to judge the exact nature and extent of change. Nonetheless, new organizational structures and management practices appear to be contributing to an "up-skilling" of many jobs within the economy (Bills 2000; Nelsen 2000). In support of this view, a 1994 survey found that 54 percent of business establishments reported an increase in job-skill requirements within the previous 3 years, while only 5 percent reported a reduction in skill requirements (National Center on the Educational Quality of the Workforce 1995).

Finally, the Baby Boom generation is now well into middle age, generally considered the prime years of one's life as a consumer and worker. As one researcher has noted, "Even if the *rates* of participation in adult education remain the same for the baby boomers as for previous cohorts, the sheer size of the cohort would seem to promise a huge *volume* of adult education" (Bills 2000). This generation of adults is also considerably more highly educated than those that came before it. Since participation in adult education is strongly related to education level (Valentine 1997; Kopka, Schantz, and Korb 1998; Kim and Creighton 1999), today's adults are likely to have a greater propensity to engage in adult education than did previous generations.

There is some evidence of the effect of these trends on adult education. First, the economic returns to higher education have been increasing (U.S. Department of Education 2000, 34); in other words, it "pays" more to go to college now than it has in the past (relative to not going to college). Second, participation in adult education increased during the 1990s (Kim and Creighton 1999), and the number of businesses providing training to their workers has increased (at least during the early 1990s; National Center on the Educational Quality of the Workforce 1995). Finally, new markets for adult education appear to be growing, including corporate universities (U.S. Department of Labor 1999), distance learning programs (Lewis et al. 1999), and postsecondary adult and continuing education offerings (Gose 1999).

Previous Research on Participation in Adult Education

Primarily because of the extensive public investment made in the formal education system, a great deal of policy-relevant research exists on this sector of education, including research on the participation of adults in postsecondary education (e.g., Choy, Premo, and Maw 1995). Federally funded adult basic education programs have also received attention (e.g., Development Associates 1993). Less regular and extensive attention has been given to the participation of adults in the wide range of formal learning activities that comprise adult education. This lack of attention can be attributed not just to the limited public investment in this area of learning, but also to the relatively varied and unsystematic nature of adult education (i.e., there is no adult education "system"), and to the lack of a perceived "problem" in this area that requires attention. With the advent of the social and economic changes discussed above, this latter view may be changing.

[1] This report distinguishes between formal *education* (elementary, secondary, and postsecondary education systems) and formal *learning* (instructional courses or programs of courses, which may be offered through the formal education system or through other providers such as an employer or community-based organization).

This report uses a regularly administered national survey of adult education, the Adult Education Survey conducted as part of NCES' National Household Education Surveys (NHES) Program, to examine two policy-relevant issues in adult education—trends in participation in adult education over time, and patterns of participation among different groups of adults. First, however, this section provides a brief overview of past research that has examined participation in adult education. The wide field of research that describes adult learning styles, evaluates adult basic education and English as a Second Language (ESL) programs, and analyzes other adult education topics beyond participation are not reviewed here.

With no readily identifiable pool of providers from which to collect information on the provision of adult education, research on participation in adult education has focused on two sources of data: (1) surveys of the recipients or targeted recipients of adult education, most commonly adults in general, but sometimes subgroups of adults (such as employees, adult college students, or participants in adult basic education or ESL programs); and (2) surveys of employers, one of the most common providers of adult education and training.

Participants in Adult Education

Survey research on participation in adult education dates back to the work of Johnstone and Rivera in the 1960s, including a household survey of adults conducted in 1962. More recent research on adult education participants includes two series of household surveys by NCES and the (NCES cosponsored) International Adult Literacy Survey (IALS), a 1994 literacy assessment and household survey conducted in the United States and five other countries.[2] The NCES surveys consist of a series of triennial surveys conducted in 1969, 1972, 1975, 1978, 1981, and 1984 as supplements to the Current Population Survey (CPS), and the Adult Education Survey series conducted as part of the NHES Program in 1991, 1995, and 1999. The NHES Adult Education Surveys provide the data used in this report, and are discussed later in this chapter; the focus in this section is on the earlier surveys.

In their 1962 survey, Johnstone and Rivera (1965) found that 22 percent of adults had participated in some type of adult education—a lower percentage than has been found in more recent years.[3] Johnstone and Rivera also studied the demographic and social characteristics of participants in adult education. Their profile suggests that "The adult education participant is just as often a woman as a man, is typically under forty, has completed high school or more, enjoys an above average income, works full time and most often in a white collar occupation, is married and has children, and is found in all parts of the country, but more frequently in the West than in other regions" (Johnstone and Rivera 1965, 8; quoted in Merriam and Cafferella 1999).

Most aspects of this participant profile have been reaffirmed in subsequent research on adult education. For example, both the early CPS surveys (Kay 1982) and the IALS (Valentine 1997) found that younger adults participated in adult education at higher rates than older adults, with rates being particularly low for those over age 54; those with more education participated at higher rates than those with less education; those in professional or supervisory jobs participated at a higher rate than those in other jobs; and those who were in the labor force participated at higher rates than those who were not in the labor

[2] More recent administrations of the IALS, in 1995 and 1997, have been conducted in additional countries. The United States participated only in the 1994 administration.

[3] In 1995 and 1999, participation rates were 40 percent or higher (Kim et al. 1995; Kim and Creighton 1999). These more recent rates may not be fully comparable to the 1962 rate, however, as they are based on different survey instruments and methodologies than those used by Johnstone and Rivera.

force. Kay (1982) also found, as did Johnstone and Rivera, that those with higher incomes participated at higher rates than those with lower incomes and that Whites participated at a higher rate than minorities. Women participated at a higher rate than men in the CPS surveys, while there was no sex difference in participation on the later administered IALS. This discrepancy was explained by Valentine (1997), who noted that sex differences in participation were common in earlier years, but had disappeared by the 1990s (i.e., the time of the IALS survey).

In addition to examining who participates in adult education, researchers have also focused on understanding why people participate in adult education. Previous research based on the NHES and IALS surveys shows that adults most often cite job-related reasons as their main reason for participation in adult education (Kopka and Peng 1993; Kim et al. 1995; Valentine 1997; Merriam and Cafferella 1999). Valentine (1997) also observed an increase from the 1970s to 1994 in the proportion of adult education that is job-related.

Other studies have focused on adults' participation in particular activities or types of education, such as in adult basic education (ABE) programs, ESL programs, postsecondary education, and employer-provided training. These studies are summarized below.

ABE and ESL Participants

For many decades, the federal government has supported both ABE and ESL programs. This federal funding reflects policymakers' interest in ensuring a full range of opportunities for adults to attain basic literacy and education credentials, regardless of adults' backgrounds or initial schooling experiences. This federal interest has resulted in an extensive evaluation literature on federally supported ABE and ESL programs, but nationally representative data on participants in these programs are rare. One source for such information is the National Evaluation of Adult Education Programs, conducted in 1991–92. As part of this evaluation, Development Associates (1993) constructed profiles of participants in ABE programs and in ESL programs. The profiles were based on a national sample of new entrants to federally supported ABE and ESL programs over a 12-month period, from April 1991 to April 1992.

Comparing the findings of this study to 1990 Census data for adults age 18 or older suggests that the following groups of adults may be overrepresented among ABE participants: young adults, women, non-Hispanic Blacks, adults who have not completed high school, and unemployed adults.[4] For example, only 8 percent of ABE participants were over age 45, while 42 percent of adults age 18 or older were over age 44. Participants in ABE were 61 percent female, compared to 52 percent of adults. Participants in ABE were 22 percent non-Hispanic Black, while the adult population was 11 percent non-Hispanic Black. Eighty-nine percent of ABE participants had not completed high school, compared to 25 percent of the adult population. The unemployment rate among ABE participants was 27 percent, compared to 5 percent for the nation as a whole in 1991. Participants in ESL were also relatively young, and had relatively high levels of unemployment; only 11 percent of ESL participants were over age 44, and 18 percent were unemployed. Even though almost half of ESL participants did not have a high school diploma, almost one-quarter had a college degree, which appears to be similar to the college degree rate for the population as a whole.[5] Not surprisingly, Hispanics and Asians appear to be

[4] The findings discussed in this paragraph could not be tested for statistical significance because standard errors are not available for the Development Associates study.

[5] Twenty-three percent of ESL participants reported that they had some type of postsecondary degree; in 1998, 24 percent of adults were college graduates (U.S. Census Bureau 1999, 171).

overrepresented among ESL participants, while non-Hispanic Whites and non-Hispanic Blacks were underrepresented. Participants in ESL were 67 percent Hispanic (compared to 8 percent of adults), 22 percent Asian (compared to 3 percent of adults), 8 percent non-Hispanic White (compared to 78 percent of adults), and 2 percent non-Hispanic Black (compared to 11 percent of adults). The ESL participants, however, were about as likely as adults in general to be female (54 percent versus 52 percent, respectively). (All data for adults are from the U.S. Census Bureau 1999.)

Adults in Postsecondary Education

The most recent profiles of adults in postsecondary education come from a report describing older undergraduates in 1989–90 (Choy, Premo, and Maw 1995). This report defined older undergraduates as those age 25 or older, and compared these older undergraduates to their younger counterparts. Although Choy, Premo, and Maw did not compare older undergraduates to the adult population in general, the characteristics of these older students can be compared to those of all adults age 25 or older in the 1990 U.S. Census. This comparison suggests that minorities and non-Hispanic Whites are equally represented among older undergraduates, as the racial/ethnic distribution of these older students and all adults are similar (e.g., 76 percent of older students were non-Hispanic Whites compared to 79 percent of all adults). Women were overrepresented among older undergraduates; 59 percent of older undergraduates were female, while 53 percent of the adult population was female. Employed adults also appeared to be overrepresented among older undergraduates. This was evident in the relatively high employment rates among older students; 75 percent of older undergraduates were employed, compared to 63 percent of the adult population in 1990.[6] (All data for adults are from U.S. Census Bureau 1999.)

Choy, Premo, and Maw (1995) also found that older undergraduates had a relatively large increase in their participation in postsecondary education from 1970 to 1991. While enrollments of younger students increased 27 percent over this period, enrollments of older students increased 171 percent. By 1991, these older students made up 45 percent of the total undergraduate population.

Participants in Employer-Sponsored Training

A few surveys have been conducted that assess the nature and extent of employer-provided training. This type of training is a major component of adult education in general, and of work-related learning in particular (Hudson 1999). Two national surveys that collected information on this topic are of note: the Survey of Employer-Provided Training, sponsored by the Bureau of Labor Statistics (BLS) within the U.S. Department of Labor, and the National Employer Survey, sponsored by the U.S. Department of Education's Office of Educational Research and Improvement. The BLS survey is a particularly rich source of data on who receives employer-sponsored training, as this survey included both an employer and employee component.

Survey of Employer-Provided Training. The Survey of Employer-Provided Training was administered in 1995 to a nationally representative sample of private business establishments with more than 50 employees, and to a sample of employees in these establishments. This survey found that 93 percent of business establishments offered or financed formal training programs for their employees in the previous 12 months, and that 70 percent of employees reported receiving employer-provided training (Frazis et al. 1998).

[6] The difference in employment rates could not be tested for statistical significance because standard errors were not available in Choy, Premo, and Maw (1995).

The Survey of Employer-Provided Training provides information on the workplace characteristics related to participation in employer-provided training. For example, employees in larger establishments were more likely than those in smaller establishments to receive training. Workers in some industries (mining; finance, insurance and real estate) were more likely to receive training than were those in other industries (wholesale and retail trade). Finally, employees in establishments with low turnover, more benefits, and less hierarchical work practices were more likely to receive training than those in establishments with, respectively, high turnover, fewer benefits, and more hierarchical work practices.

The Survey of Employer-Provided Training also examined the demographic and labor force characteristics of workers who received employer-provided training. These participants often looked like adult education participants in general (cf. Johnstone and Rivera 1965; Kay 1982; Valentine 1997). For example, there was no difference in the percentages of women and men who received training. Receipt of training was related to education level, with 90 percent of workers with a bachelor's degree receiving training, compared to 60 percent of workers with no more than a high school diploma. Higher percentages of full-time and high-income workers received training than did other workers, and receipt of training was highest among the combined group of professional, paraprofessional, and technical workers, followed by managerial and administrative workers, then by all other groups of workers. But a few of the findings from this survey differ from studies of adult education participants. For example, both older *and younger* workers were less likely to receive training than were mid-aged workers. There were also no differences by race/ethnicity in the receipt of training.

National Employer Survey. The National Employer Survey was conducted in 1994, 1997, and 2000. In each year, the survey was administered to a nationally representative sample of private business establishments that had at least 20 employees. While later administrations of the survey focused on school-to-work issues, the initial administration focused on worker training. The 1994 survey found that 81 percent of establishments provided formal training for their employees, and that just over 40 percent of workers had received formal training (Lynch and Black 1996). These percentages are notably lower than those found by the Survey of Employer-Provided Training. One possible reason for this difference is that the National Employer Survey included smaller-size employers (who are less likely to offer training; see Frazis et al. 1998; Lynch and Black 1996) than did the Survey of Employer-Provided Training.

Findings from the National Employer Survey on factors that determine whether an employer offers training imply that characteristics of the establishment's employees play a significant role. Establishments with staff that have higher concentrations of men, minorities, and professional workers are less likely to provide training than are enterprises with fewer such employees (Lynch and Black 1996). However, it is difficult to interpret these findings, because these data do not indicate *which* employees within an establishment received training. For example, it may be that even though employers with relatively low proportions of professional workers provide training more often than those with higher proportions of professional workers, the training they do provide may be mainly targeted on professionals.

The Current Study

Surveys about employer-provided training supply valuable information for employers, employees, and labor policy analysts, but are of more limited utility in the realm of education policy. Although the formation and continued development of human capital within the labor market is a critical endeavor, other forms of learning—such as language acquisition, basic skills development, and higher educa-

tion—are also critical for such important goals as social integration and cohesion, personal fulfillment, and community development (Organization for Economic Cooperation and Development 1997). For policymakers and researchers interested in the current status of adult education broadly defined, studies of adults in general, including a wide range of formal learning activities, are more relevant. The household surveys of adults discussed above are only suggestive of current conditions, however, as none of those surveys provides data beyond 1994. This report uses data from NCES' NHES Adult Education Surveys to provide more recent and comprehensive information on participation in adult education.

Like previous household surveys, the NHES Adult Education Surveys allow for an examination of the characteristics of adult education participants. The regular administration of the NHES Adult Education Survey throughout the 1990s also permits examination of recent trends in participation over time. These issues are important for a number of reasons. An examination of trends in participation allows policymakers to understand the dynamics of adult education, including changes in the demand for specific types of activities. For example, are adults switching from comprehensive credential programs to a more "cafeteria" style of educational participation, or are increases consistent across types of education activities? An examination of patterns of participation also spotlights equity issues. Are historical differences in patterns of participation changing? Specifically, are minorities, those with lower levels of education, those not in the labor force, or those in nonprofessional occupations closing the gap in participation? Are there differences across groups in the types of education activities in which they participate, and what are the implications of these differences?

Background on the NHES Adult Education Survey

This report summarizes findings from the 1991, 1995, and 1999 NHES Adult Education Surveys. These surveys ask adults about their education activities over a 12-month period, using a random-digit-dial telephone survey of the civilian, noninstitutionalized population of the 50 states and the District of Columbia. The adult population of interest consisted of civilian, noninstitutionalized individuals age 16 or older (age 17 or older in 1991) who were not enrolled in elementary or secondary school at the time of the interview. The 1991 NHES Adult Education Survey was conducted from January through May of 1991; the 1995 survey was conducted from January through April of 1995; and the 1999 survey was conducted from January through April of 1999.

One detail of the NHES Adult Education Survey administration warrants further discussion. The surveys were administered in English and, for Spanish speakers who did not speak English, in Spanish. So the Hispanic sample is roughly comparable to the non-Hispanic White and non-Hispanic Black samples, in that few adults were likely to have been excluded from these groups for language reasons. However, Asian and other non-English-speaking minority groups may be less comparable, as a relatively high proportion of these adults may have been excluded from the survey due to language barriers. In short, the exclusion of adults who speak neither English nor Spanish reduces the sample size for certain minority groups and may also introduce bias, since the excluded adults may differ from included adults on other characteristics such as education level. This limitation should be kept in mind when interpreting findings for racial/ethnic groups.

Definition of Adult Education

Adult education means different things to different people. Some analysts count as adult education the full range of learning activities in which adults voluntarily engage (Belanger and Tuijnman 1997),

while others include only required learning activities (Cervero 1989). These definitions are typically restricted to formal learning activities, most often defined as activities that include an instructor. Yet others define adult education to include both formal and informal learning activities, so that all activities engaged in for learning purposes are included, whether an instructor is involved or not (Blomquist, Niemi, and Russkanen 1999). The Survey of Employer-Provided Training, for example, asked employees about the receipt of both formal and informal training.[7] The 1991, 1995, and 1999 NHES Adult Education Surveys defined adult education to include both voluntary and required *formal* learning activities; these surveys did *not* ask about informal learning activities.

The NHES Adult Education Surveys ask about participation in a range of formal learning activities. In the 1991 NHES Adult Education Survey, respondents were asked about their participation in full-time postsecondary education, adult basic skills programs, and ESL programs. Respondents were then asked about part-time participation in postsecondary education, followed by involvement in other courses or formal instruction. This approach was modified in later surveys. Both the 1995 and 1999 NHES Adult Education Surveys asked instead about participation in six types of formal learning activities, in the following order:

- *English as a Second Language:* Classes for adults whose main language is not English, to develop the English language skills necessary to pursue further education, enter or advance in the job market, enrich their personal and family lives, or to better adapt to American society.
- *Adult basic education, General Educational Development (GED) preparation classes, and adult high school programs*: Programs or classes to help adults improve basic reading, writing, and math skills or to prepare for a high school diploma or its equivalent. These activities are referred to in this report as ABE programs.
- *Credential programs*: Formal postsecondary programs leading to a college or university degree, or a vocational or technical diploma or certificate; or a formal vocational training program.
- *Apprenticeship programs*: Formal, on-the-job training and other related instruction leading to journeyman status in a skilled trade or craft.
- *Job- or career-related courses*: Courses related to a job or career other than ABE, ESL, credential, or apprenticeship programs.
- *Personal development courses*: Educational activities that have an instructor and are not included in the categories described above. Examples include courses related to health, hobbies or sport lessons, foreign language lessons, and Bible study.

In all 3 years, respondents who participated in any adult education activity were asked to provide one main reason for their participation in each activity. These reasons were coded during the interview into six or seven categories that varied slightly by survey section. But for each activity, two of the coded reasons can be characterized as work-related: (1) to improve, advance, or keep up to date on current job; and (2) to train for a new job or a new career. All other reasons (e.g., to improve basic reading, writing, or mathematics skills; for a personal, family, or social reason) can be characterized as nonwork-related.

[7] To maintain consistency with other adult education surveys, the findings from the Survey of Employer-Provided Training discussed in this report describe participation in *formal* training only.

Classification of Participants and Learning Activities

Participants. For this report, participation in adult education was determined by whether the respondent was involved in at least one of the listed activities in each survey. However, since the continuous pursuit of formal education is typically not considered adult education, full-time participation in postsecondary credential programs by those age 24 or younger was not counted as an adult education activity.[8] All other formal learning activities engaged in by those age 24 or younger (including part-time credential programs) were counted as an adult education activity. Thus, an 18-year-old who is enrolled in a full-time bachelor's degree program and is taking guitar lessons part time would count as an adult education participant. An 18-year-old who is enrolled in a bachelor's degree program and who participated in no other formal learning activity in the past year would be counted as a nonparticipant.

To examine patterns of participation among adults, self-reported responses on the NHES Adult Education Surveys were used to classify adults by age, sex, race/ethnicity, education attainment level, labor force status, occupation group (or status),[9] and (in 1995 and 1999) by whether the adult had a continuing education requirement. These variables were selected for analysis because of their policy relevance and their previously established relationship to participation in adult education. Table 1 lists the specific categories used for each of these sociodemographic variables, as well as the distribution of the adult population (in the 1999 NHES Adult Education Survey) among these categories.

Adult education activities. Adult education activities were categorized based on the type of program involved and the respondent's main reason for participation. Specifically, the 1995 and 1999 NHES Adult Education Survey sections were used to categorize activities as: ESL programs, ABE programs, apprenticeship programs, and credential programs.[10] Activities in the remaining sections (job- or career-related courses; personal development courses) were then categorized, based on the respondent's main reason for taking the course, into work-related courses (courses taken primarily for a current job or a new job) and nonwork-related courses (courses taken primarily for any reason other than a current or new job).

This classification of work-related courses differs from past NCES reports based on the NHES Adult Education Survey, in which work-related adult education was typically defined as all activities listed within the "job- or career-related courses" section of the survey. Other definitions of work-related education are also possible; for example, *all* activities for which the respondent listed a work-related main reason for participation could be counted as work-related education. The approach taken in this report was designed to provide a compromise between the desire to classify activities along policy-relevant dimensions (for example, keeping ABE and ESL separate) and the desire to capture a broad range of work-related courses.

[8] This age-restricted definition differs from the definition used in previous NCES reports on the NHES Adult Education Survey, which excluded participation in *all* full-time credential programs.

[9] Because the occupation groups used in this report fall on a socioeconomic status hierarchy (see Montagna 1977), occupation group findings are sometimes discussed in this report in terms of occupational status. From higher to lower status, the occupation groups are professional and managerial occupations; sales, service and support occupations; and occupations in the trades.

[10] Some of the activities identified in these sections may refer to individual courses rather than programs; however, since these activities are generally taken as part of a program of instruction, the term "program" is used as a short-hand in place of "course or program."

Table 1.—Estimated number of adults and percentage distributions of adults with each demographic, educational, and labor force characteristic: 1999

Characteristic	Estimate
Total number of adults*	194,625,000
Age	
16–24	12
25–34	19
35–44	23
45–54	18
55–64	12
65 or older	15
Sex	
Female	52
Male	48
Race/ethnicity	
White, non-Hispanic	74
Black, non-Hispanic	11
Hispanic	10
Asian	3
Other minority	2
Education level (highest level of education completed)	
Less than high school (no high school diploma or its equivalent)	17
High school (high school diploma or its equivalent)	29
Some college (postsecondary vocational certificate, associate's degree, one or more years of college but no postsecondary credential)	27
Bachelor's or higher (bachelor's degree or higher degree)	28
Labor force status	
Employed full time (at least 35 hours/week)	57
Employed part time (fewer than 35 hours/week)	12
Unemployed (not employed, looking for work)	4
Not in labor force, not retired	15
Retired	13
Occupation group	
Professional and managerial	28
Sales, service, and support	25
Trades (manual trade occupations)	16
Not employed	32
Continuing education status	
Has continuing education requirement	27
Does not have continuing education requirement	73

* Rounded to the nearest 1,000.

NOTE: See table B.1 in appendix B for standard errors. Details may not sum to 100 due to rounding. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

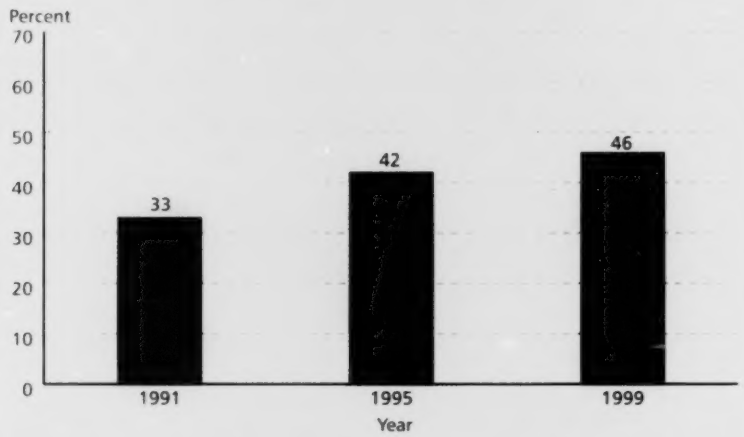
An attempt was made to create comparable activity categories in the 1991 NHES Adult Education Survey. Unfortunately, because of the differences in the structure of the 1991 survey compared to the 1995 and 1999 surveys, these specific categories were not fully comparable from 1991 to the later years. For this reason, specific types of adult education activities are not identified in this report for the 1991 NHES Adult Education Survey.

Some of the participation and sociodemographic variables used in this report were developed by combining or reclassifying items from the NHES Adult Education Survey questionnaires. For details on these derived variables, and for further information on the administration of the NHES Adult Education Surveys, see appendix A.

Chapter 2: Patterns and Trends in Participation

As discussed in chapter 1, many adults participate in adult education over the course of a year, and the percentage who do so increased during the 1990s. In 1991, about one-third of adults engaged in some type of formal learning activity over the course of a year; by 1999, that percentage had increased to almost one-half[11] (figure 1). The remainder of this report examines in more detail the adults and the adult education activities that account for this upward trend in participation, as well as who participates in different types of activities.

Figure 1.—Percent of adults who participated in adult education: 1991, 1995, and 1999



NOTE: See table B.2 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

This chapter examines whether the upward trend in participation applies to all adults, or whether some groups of adults did not increase, or even decreased, their level of participation between 1991 and 1999. The chapter examines adults by age, sex, race/ethnicity, education level, labor force status, and occupation group. The findings will show that the increase in participation was fairly broad in scope, applying to most of the sociodemographic groups examined here. As part of the examination of participation trends, this chapter also examines patterns of participation in 1991 and in 1999; these patterns largely, but not completely replicate those found in Valentine's (1997) study of participation in adult education using the 1994 IALS. This study also expands past findings by showing how patterns of participation changed between 1991 and 1999.

[11] The participation rates in this report are higher than those in past NCES reports because the rates in past reports excluded all full-time college coursetaking; this report excludes full-time college coursetaking only among those age 24 or younger.

Questions addressed in this chapter include:

- What was the pattern of participation in adult education in 1991? Which groups of adults participated more than others?
- Which groups of adults increased their participation between 1991 and 1999, and which groups did not increase their participation? Did any groups of adults experience a decline in participation?
- Did differences in participation rates among groups of adults in 1991 remain in 1999, or did they change over time? For example, did the adults who had relatively high rates of participation in 1991 continue to have relatively high participation rates in 1999?

Of particular concern in this chapter is whether groups participating at lower rates in 1991 increased their participation by 1999 to be equivalent to other groups. For example, have the participation rates of adults with low education levels increased to match those of adults with higher levels of education? This chapter will show that in some cases the overall increase in participation represents a rising tide that has left differences among groups unchanged, while in other cases differences between groups have been eliminated.

Participation by Age

Participation rates varied by age in both 1991 and 1999 (figure 2). In 1991, mid-aged adults participated at the highest rates, and older adults participated at the lowest rates. Specifically, there was no difference in overall participation between those ages 25–34 and those ages 35–44. With one exception, both of these mid-aged groups participated at higher rates than those ages 16–24 and than those older than age 45.[12] Adults in the two oldest age groups (55–64, and 65 or older) participated at a lower rate than did all groups of younger adults.

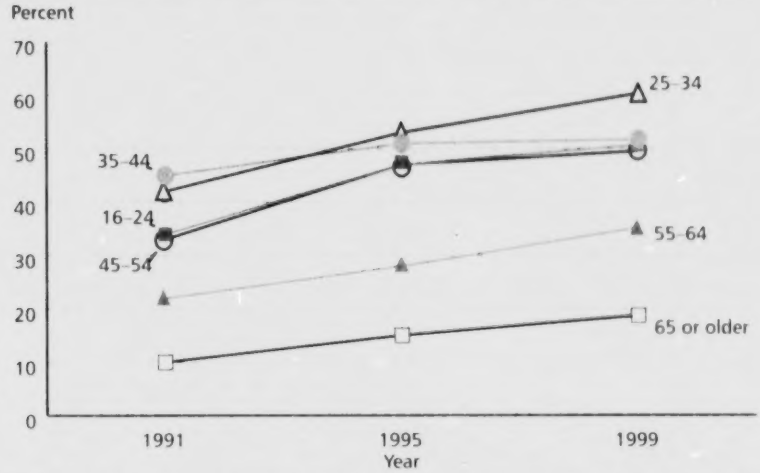
Between 1991 and 1999, there was a significant increase in the participation rate for all age groups, with the exception of those ages 35–44, an age-group that had one of the highest participation rates in 1991. As a result of this pattern of change, in 1999 those ages 25–34 had a higher participation rate than those ages 35–44.

Thus, in 1999, a slightly different picture emerges; mid-aged adults no longer participate at a higher rate than younger adults; instead, participation rates are fairly level through age 45–54, and decline after that. Specifically, those younger than 25 no longer participate at lower rates than those ages 25–34 and 35–44 (51 percent, 60 percent, and 52 percent, respectively); there is also no significant difference in the participation rates of those ages 35–44 and those ages 45–54 (52 percent versus 50 percent, respectively). In 1999, the only consistent difference by age is the lower participation rate of the two oldest age groups compared to those in younger age groups.

Age differences in participation rates can be difficult to interpret in cross-sectional data such as the NHES Adult Education Survey. For example, the relatively low participation rates among older adults in 1991 could reflect either an age effect or a cohort effect. If it is an age effect, this finding would be

[12] The difference between those ages 25–34 (42 percent) and those ages 45–54 (33 percent) approached, but did not reach statistical significance.

Figure 2.—Percent of adults who participated in adult education, by age: 1991, 1995, and 1999



NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16-24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

consistent across cohorts (generations) of adults. If it is a cohort effect, this finding reflects a level of participation that is unique to this particular cohort and that would differ for the same age group at different points in time. The findings of cross-sectional studies conducted in various years, however, suggest that this is an age effect. For example, both the 1991 and 1999 NHES Adult Education Surveys found that older adults participate at lower rates than younger adults. Other studies of adult education since the 1960s also have consistently found that older adults (typically those in their mid-50s or older) participate at lower rates than younger adults (Johnstone and Rivera 1965; Kay 1992; Valentine 1997). This consistency in findings over time strongly implies that the lower participation rate of older adults reflects an age effect rather than a cohort effect—that is, older adults in general (as opposed to one particular cohort of older adults) are less likely to participate in adult education than their younger counterparts.

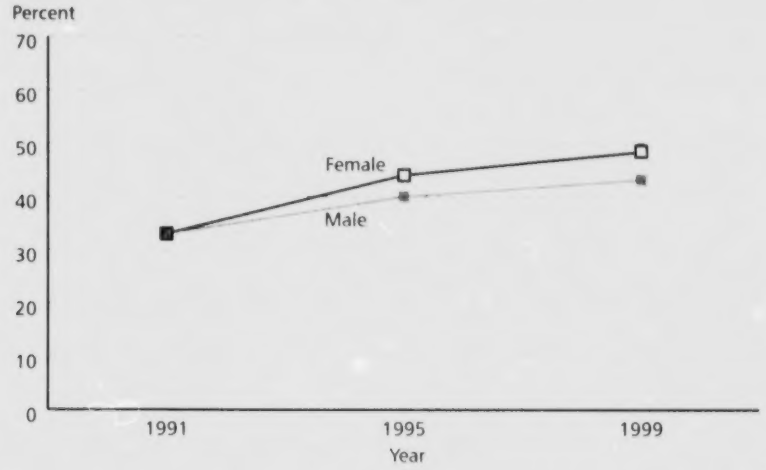
Participation by Sex, Race/Ethnicity, and Education Level

Participation by sex. In 1991, there was no difference in the participation rates of men and women in adult education (consistent with the 1994 IALS study [Valentine 1997]). Participation rates for both men and women increased significantly between 1991 and 1999. Men participated at a rate of 33 percent in 1991 and 43 percent in 1999, while women participated at a rate of 33 percent in 1991 and 48 percent in 1999. Because of a larger increase among women, by the end of the decade, women participated in adult education at a higher rate than men (figure 3).

Participation by race/ethnicity.[13] Participation rates differed by race in 1991, but not in 1999 (figure 4). In 1991, non-Hispanic Blacks participated at a lower rate than non-Hispanic Whites; 26 percent of non-Hispanic Blacks participated in adult education compared to 34 percent of non-Hispanic Whites.

[13] Throughout this report, non-Hispanic Whites are compared to each of the other racial/ethnic groups. The latter groups are not compared amongst themselves.

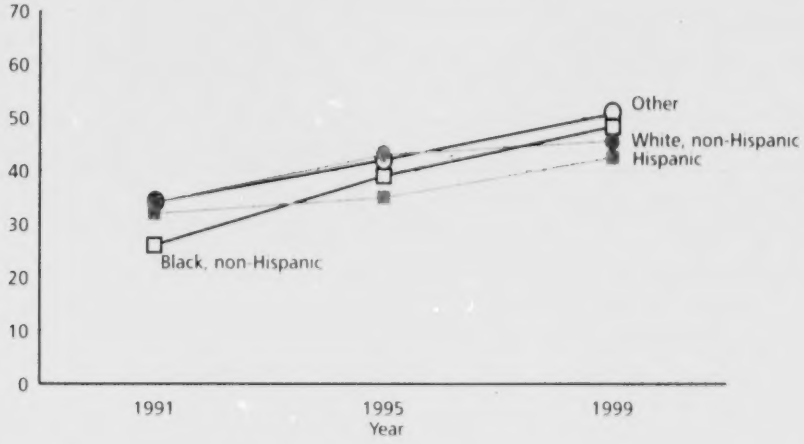
Figure 3.—Percent of adults who participated in adult education, by sex: 1991, 1995, and 1999



NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

Figure 4.—Percent of adults who participated in adult education, by race/ethnicity: 1991, 1995, and 1999



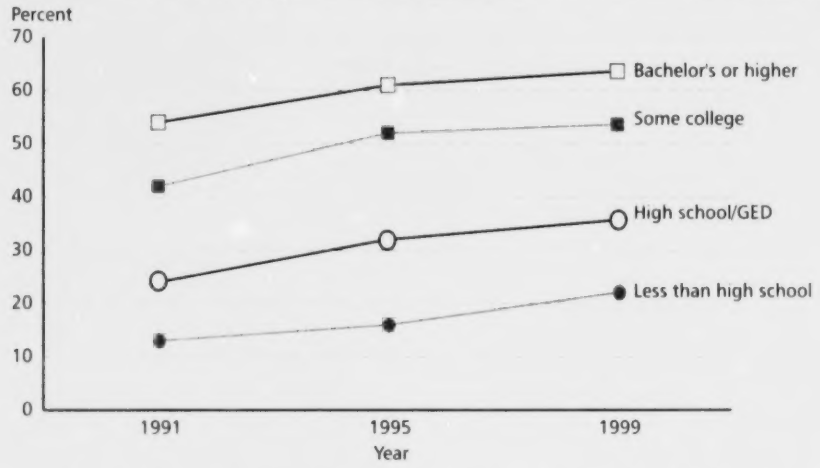
NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

Hispanics and other minority groups (combined) participated at the same rate as non-Hispanic Whites.[14] Between 1991 and 1999, participation in adult education increased among non-Hispanic Whites (34 to 46 percent), non-Hispanic Blacks (26 to 48 percent), Hispanics (32 to 43 percent), and for the category comprising all other race/ethnic groups (34 to 51 percent). Because of the particularly large increase in the participation rate for non-Hispanic Blacks, by the end of the decade there was no measurable difference between non-Hispanic Blacks (as well as other minorities) and non-Hispanic Whites in their participation in adult education. However, as will be seen in chapter 3, certain racial/ethnic groups are more likely than others to participate in specific types of adult education activities.

Participation by education level. The positive relationship between education level and participation in adult education found in previous studies (Kim et al. 1995; Valentine 1997) was also evident in this study (figure 5). In 1991, adults with higher levels of education participated in adult education at a higher rate than those with lower levels of education. Between 1991 and 1999, participation rates increased for adults at each education level. Participation rates increased from 13 percent to 22 percent for those with less than a high school diploma, from 24 to 36 percent for those with only a high school diploma, from 42 to 54 percent for those with some college education, and from 54 to 64 percent for those with a bachelor's degree or higher. Because increases occurred at every education level, the disparity in participation among education groups did not disappear; in 1999, it was still true that adults with higher levels of education participated at higher rates than those with lower levels of education.

Figure 5.—Percent of adults who participated in adult education, by education level: 1991, 1995, and 1999



NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

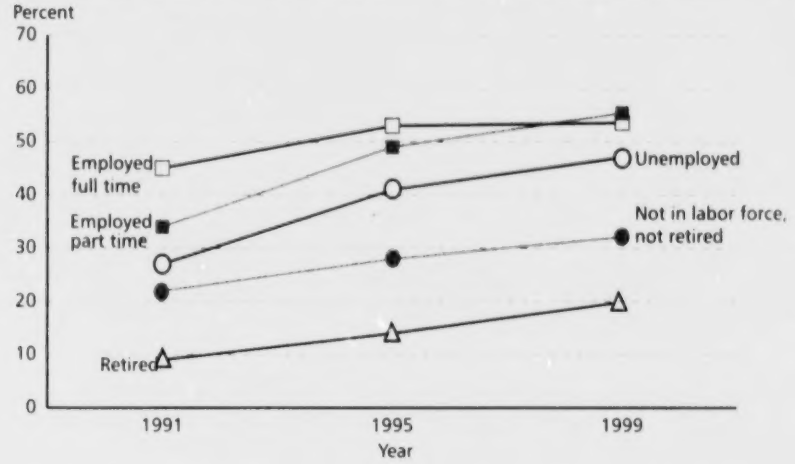
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

[14] If Asians are separated from the other racial/ethnic group, there is not a statistically significant increase in participation among this group, even though their participation rate was 36 percent in 1991 and 53 percent in 1999. This lack of significance may be due to the relatively small sample sizes and corresponding high standard errors and lack of statistical power for this comparison. (See discussion on "Background on the NHES Adult Education Survey" in chapter 1.)

Participation by Labor Force Status

Adults' labor force status is also related to participation in adult education (figure 6). In 1991, full-time workers participated in adult education at a higher rate (45 percent) than did all other groups of adults—part-time workers (34 percent), the unemployed (27 percent), retirees (9 percent), and those otherwise not in the labor force (22 percent). Retired adults participated at a lower rate than all other groups.

Figure 6.—Percent of adults who participated in adult education, by labor force status: 1991, 1995, and 1999



NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

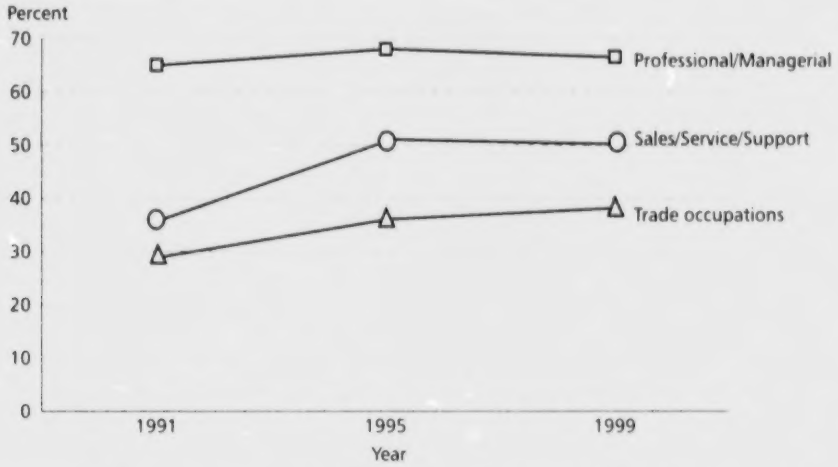
Between 1991 and 1999, participation rates increased for each labor force category. Rates increased by 9 to 11 percentage points among full-time workers, the retired, and those otherwise not in the labor force, by 20 percentage points for the unemployed, and by 22 percentage points for part-time workers. As a result of this pattern of increase, in 1999, there were no differences in participation rates between full-time workers and either part-time workers or the unemployed; in that year, only those who were out of the labor force (due to retirement or other reasons) participated in adult education at a lower rate than did full-time workers. Retired adults continued to participate at a lower rate than all other groups.

Depending on the year examined, these NHES findings are either consistent or inconsistent with the 1994 IALS study. In the IALS, full-time and part-time workers participated in adult education at the same rate (similar to the 1999, but not the 1991 NHES), and employed adults participated at a higher rate than those who were unemployed (similar to the 1991, but not the 1999 NHES) (Valentine 1997).

Participation by Occupation Group

Participation in adult education is related not just to labor force status but, among employed adults, to the adult's occupation. In 1991, those in professional and managerial jobs participated at a higher rate than other occupation groups, and those in sales, service, and support positions participated at a higher rate than those in the trades (figure 7). The participation rate for professionals and managers was 65 percent, compared to 36 percent for sales, service, and support workers, and 29 percent for workers in the trades.

Figure 7.—Percent of employed adults who participated in adult education, by occupation group: 1991, 1995, and 1999



NOTE: See table B.3 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991, 1995, and 1999.

Between 1991 and 1999, both sales, service, and support workers and trades workers increased their participation in adult education; those in professional and managerial occupations did not increase their participation rate. Participation rates among sales, service, and support workers increased over the period from 36 percent to 50 percent. Participation among trades workers increased from 29 percent to 38 percent. However, the increases in participation among these two occupation groups were not enough to change the pattern seen in 1991. In 1999, participation rates were still highest for those in professional and managerial occupations (66 percent), followed by those in sales, service, and support, then those in the trades. Valentine (1997) and Frazis et al. (1998) found a similar positive relationship between occupational status and adult education participation in, respectively, the IALS study and the Survey of Employer-Provided Training.

Summary

Patterns of participation. As past studies have shown, participation in adult education varies significantly among different groups of adults. The findings of this study (summarized in table 2) confirm past findings that participation rates are relatively low among adults who are not connected to the labor force or to high-status positions within the labor force. Specifically, participation rates are lower among older adults, with the lowest participation rate found among those age 65 or older (a group likely to include many retired adults). Participation rates are also lower among those with lower (rather than higher) education levels, among those not in the labor force (compared to those in the labor force), and among those in lower (rather than higher) status occupations. These findings reinforce the important role that employment plays in motivating participation in adult education. The only discrepancy with prior findings was the lower rate of participation among men compared to women in 1999.

Table 2.—Summary of changes in participation patterns between 1991 and 1999, and 1999 patterns of participation in adult education

Group of adults	Change in participation between 1991 and 1999	1999 participation pattern
All adults	Increase in participation	Forty-six percent of adults participated.
Age		
16–24	Increase	Two oldest age groups (55–66 and 65 or older) participate at lower rates than younger age groups.
25–34	Increase	
35–44	No change	
45–54	Increase	
55–64	Increase	
65 or older	Increase	
Sex		
Male	Increase	Women participate at a higher rate than men.
Female	Increase	
Race/ethnicity		
White, non-Hispanic	Increase	No differences in participation rates between non-Hispanic Whites and other racial/ethnic groups.
Black, non-Hispanic	Increase	
Hispanic	Increase	
Other minorities	Increase	
Education level		
Less than high school	Increase	Adults with higher levels of education participate at higher rates than adults with lower levels of education.
High school	Increase	
Some college	Increase	
Bachelor's degree or higher	Increase	
Labor force status		
Employed full time	Increase	Full-time workers participate at a higher rate than those who are retired or otherwise out of the labor force. Full-time workers participate at the same rate as part-time workers and the unemployed.
Employed part time	Increase	
Unemployed	Increase	
Not in labor force, not retired	Increase	
Retired	Increase	
Occupation group		
Professional and managerial	No change	Adults in higher status occupations participate at higher rates than those in lower status occupations.
Sales, service, and support	Increase	
Trades	Increase	

NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1991 and 1999.

Trends in participation. Increases in participation in adult education have been fairly widespread across the adult population. The only groups of adults that did not experience an increase in participation between 1991 and 1999 were two groups that had particularly high levels of participation in 1991 (adults ages 35–44, and adults in professional and managerial occupations).

Some shifts in participation patterns between 1991 and 1999 are particularly worth noting. First, participation rates among part-time and unemployed workers have increased enough to close the participa-

tion gap between these workers and full-time workers. At the same time, the lower rate of participation among non-Hispanic Blacks (compared to non-Hispanic Whites) has disappeared. And while men and women used to participate at the same rate, women now participate at a higher rate than men. These increases for non-Hispanic Blacks and women might be partly related to changes in their labor force status, as both groups were more likely to be employed later in the decade rather than earlier.[15]

On the other hand, some participation patterns remained the same between 1991 and 1999. Increasing participation rates among those in sales, service, and support occupations and in trade occupations have not closed the participation gap between these workers and those in professional and managerial occupations, or between those in sales, service, and support versus those in the trades. Consistent differences in participation rates among older adults (versus younger adults) and by education level also were found in both 1991 and 1999. These differences by age, education level, and occupation group appear to be large and resistant to change. As chapter 4 will show, age, education level, and occupation group appear to be some of the main determinants of participation in the most common types of adult education.

[15] From 1990 to 1998, the employment rate for non-Hispanic Whites increased 0.9 percentage points, from 63.7 to 64.6, while for non-Hispanic Blacks it increased 3.0 percentage points, from 56.7 to 59.7. For men, the employment rate dropped slightly from 72.0 to 71.6, while for women it rose from 54.3 to 57.1 (U.S. Census Bureau 1999).

Chapter 3: Participation Patterns and Trends by Activity Type

Adult education encompasses a wide range of activities, from ESL courses to postsecondary education programs to training taken at work. The previous chapter showed that recent growth in this broad spectrum of adult education activities is fairly widespread across most groups of adults. Another way to examine the nature and extent of this growth is to look at participation in specific types of adult education activities. Past studies using NHES Adult Education Survey data have shown that relatively few adults participate in credential programs, and fewer still in ESL, ABE, or apprenticeship programs; most adult education comprises courses taken outside of these programs (Hudson 1999; Kim and Creighton 1999). The 1995 and 1999 NHES Adult Education Surveys permit examination of participation trends for each of these types of adult education.

As previously mentioned, the structure of the 1991 NHES Adult Education Survey instrument does not allow for comparisons of specific types of activities in 1991 to activities in later years. This chapter uses the similarly structured 1995 and 1999 surveys to examine changes in participation in specific types of adult education activities between 1995 and 1999. This chapter also examines patterns of participation in each type of activity, as of 1999. These analyses will show that growth in adult education over this time period encompassed most types of activities and that, as one might expect, patterns of participation vary depending on the type of adult education activity involved.

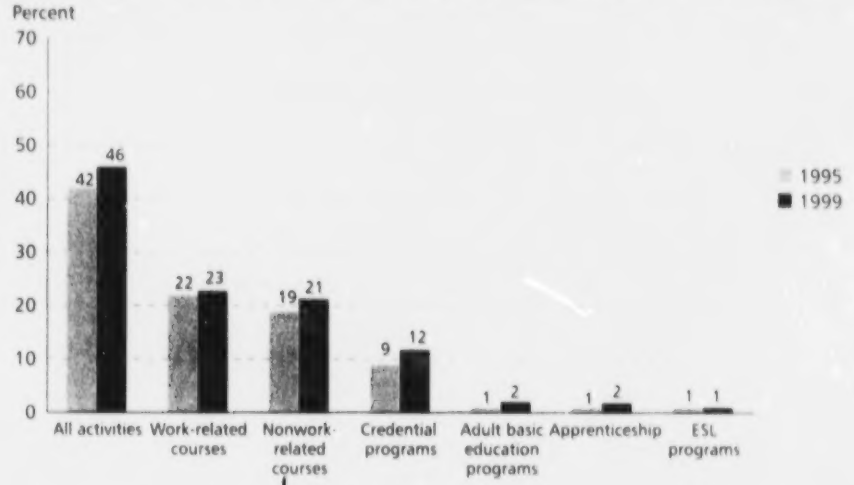
This chapter addresses the following questions:

- In which types of adult education activities do adults most frequently participate?
- Which activities account for the growth in overall participation in adult education?
- Which adults are most likely to participate in each type of activity?
- How do patterns of participation by different groups of adults vary among activities, and how do they compare to the overall pattern of participation?

Participation by Activity Type

As noted in chapter 1, this report classifies the formal learning activities listed in the NHES Adult Education Survey into six types: ESL programs, ABE programs, apprenticeship programs, credential programs, courses taken primarily for work-related reasons (work-related courses), and courses taken primarily for reasons other than work (nonwork-related courses). In both 1995 and 1999, the most popular adult education activities were work-related courses and nonwork-related courses; about one in five adults participated in each of these activities in each year (figure 8). Credential programs were the next most popular, with roughly 10 percent of adults participating in these programs each year (excluding "traditional" college enrollments). Only 1 to 2 percent of adults participated in each of the remaining activities—ESL, ABE, and apprenticeship programs—in either year. The low percentages for these latter three programs do not mean that these programs are not popular or not of value; they

Figure 8.—Percent of adults who participated in each type of adult education activity: 1995 and 1999



NOTE: See table B.2 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity. Adults may have participated in more than one activity in each survey year.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1995 and 1999.

merely reflect the fact that ESL, ABE, and apprenticeship programs are targeted to a more restricted group of adults than are other adult education activities. For example, in 1999, the participation rate in ABE programs among those who did not have a high school diploma was 8 percent, and the participation rate in ESL programs among those who usually spoke a language other than English at home was 11 percent.

The predominance of work-related and nonwork-related courses over credential, ABE, ESL, and apprenticeship programs is even clearer when one looks at the distribution of adult education *participants* among learning activities. More than 8 out of 10 participants (82 percent) took a work-related or nonwork-related course in 1999; only one-fifth of all 1999 participants were enrolled in a credential program, and no more than 5 percent took an ABE, apprenticeship, or ESL program (Kim and Creighton 1999). As will be seen below, overall participation patterns tend to reflect the patterns for work-related and nonwork-related courses, since the preponderance of adult education participation occurs within these courses.

Changes Over Time in Participation by Activity Type

Between 1995 and 1999, participation in all adult education activities combined increased from 42 percent to 46 percent[16] (figure 8). This overall increase reflects growth in most types of adult education activities. Every activity except ESL programs and work-related courses experienced a significant increase in participation between 1995 and 1999; participation in ESL programs and work-related courses remained relatively constant over this period. Participation rates increased from 19 to 21 percent for nonwork-related courses; from 9 to 12 percent for credential programs; and from 1 to 2 percent for both ABE and apprenticeship programs. The growth in nonwork-related courses suggests that while labor

[16] See footnote 11.

market pressures may account for some of the increase in adult education, other factors are operating as well, motivating a growth in education activities that are unrelated to work demands.

Why did the participation rates *not* increase for ESL programs and work-related courses? First, the time period examined (1995 to 1999) is relatively short; a longer time trend might have revealed increases in both of these activities, as well as in other formal learning activities. The constant rate of participation for work-related courses might be largely due to the relatively high and constant participation rate of professional and managerial workers (figure 7), as this group of adults accounted for 54 percent of all work-related course participants in 1999. The constant participation rate in ESL programs may partly result from the fairly steady immigration rate during the late 1990s (U.S. Census Bureau 1999, 10). In addition, the NHES Adult Education Surveys were conducted only in English and Spanish; adults who did not speak either of these languages were excluded from the interview. As a result of this exclusion, increases in ESL participation among Asian or other non-Spanish-speaking immigrants are likely to be underestimated in these surveys (and ESL participation rates in general are likely to be underestimated). Finally, the NHES Adult Education Survey sample for ESL-eligible adults may be too small to detect anything other than large changes in participation in ESL programs.

Because of the relatively low overall participation rate in ESL programs, participation in ESL programs is not examined in the remainder of this chapter. Apprenticeship programs are also not examined, both because they have a relatively low participation rate and because participation in these programs is directly linked to occupational requirements.

Participation in Specific Activities

The previous chapter showed that some groups of adults are more likely to participate in adult education than are others. But given the variety of activities encompassed by adult education, overall patterns of participation for all activities may not apply to each type of activity. This section of the report examines the more specific participation patterns that characterize participation in ABE, credential, work-related, and nonwork-related activities as of 1999. Since ABE and credential programs have the more unique patterns of participation, these programs are examined separately. As will be seen, participation patterns for both of these activities largely reflect the education level of the group to which the programs are targeted—those who have not completed high school in the first case, and those who resemble the "traditional" college student in the second case. This section then looks at participation in the two most popular adult education activities, work-related courses and nonwork-related courses, comparing them to each other.

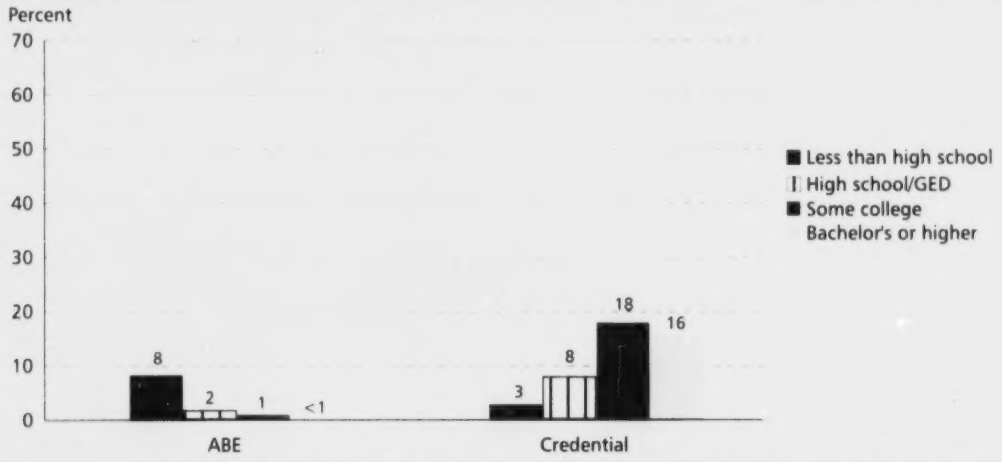
The chapter ends with a comparison of how participation patterns within each activity compare to overall participation patterns. In the subsequent chapter, regression analysis is used to determine the independent effects of each population characteristic on participation in the two most common types of adult education.

Participation Patterns in ABE Programs

ABE programs are typically targeted to a narrow group of adults (with low levels of skills or education) that is notably different from the general adult population. So it is not surprising that this group of participants is relatively small (only 2 percent of adults participated in 1999), and that participation patterns for ABE programs are often strikingly different from overall participation patterns. For ex-

ample, the highest rates of participation in ABE programs are among those who have not completed high school (8 percent); very few adults who have completed high school participate in these programs (no more than 2 percent in any group; figure 9).

Figure 9.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by education level: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

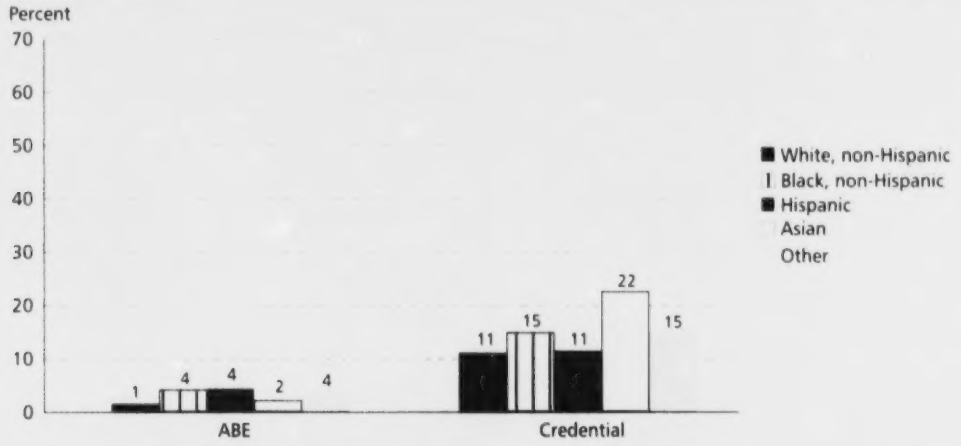
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Likewise, groups that tend to have lower education levels—such as non-Hispanic Blacks, Hispanics, workers in nonprofessional or nonmanagerial occupations, and those who do not have continuing education requirements—participate in ABE programs at higher rates than (respectively) non-Hispanic Whites, those in professional/managerial jobs, or those who do have continuing education requirements (figures 10–12). Four percent of non-Hispanic Blacks and 4 percent of Hispanics participated in ABE programs in 1999, compared to 1 percent of non-Hispanic Whites. This finding may be at least partially consistent with the National Evaluation of Adult Education Programs, where those who have not completed high school and non-Hispanic Blacks appeared to be overrepresented among ABE participants (Development Associates 1993). The current study also found that less than 1 percent of those employed in professional and managerial occupations participated in ABE programs in 1999, compared to 3 percent of those in sales, service, and support jobs, and 3 percent of those in the trades. Among adults with continuing education requirements, 1 percent participated in ABE programs, while 2 percent of those without such requirements participated.

Men and women participated in adult basic education programs at equivalent rates (about 2 percent; figure 13), as did adults who were employed full time versus those who were employed part time, unemployed, or not in the labor force and not retired; retired adults participated at a lower rate than all other adults (figure 14).[17] These findings are inconsistent with the National Evaluation of Adult Education Programs. In that study, women and the unemployed participated in ABE programs at relatively high rates (Development Associates 1993). This inconsistency might reflect changes over time (from

[17] While it may appear in figure 14 that the unemployed participated at a higher rate than full-time employees, because of the large standard error associated with the estimate for the unemployed, this difference was not statistically significant.

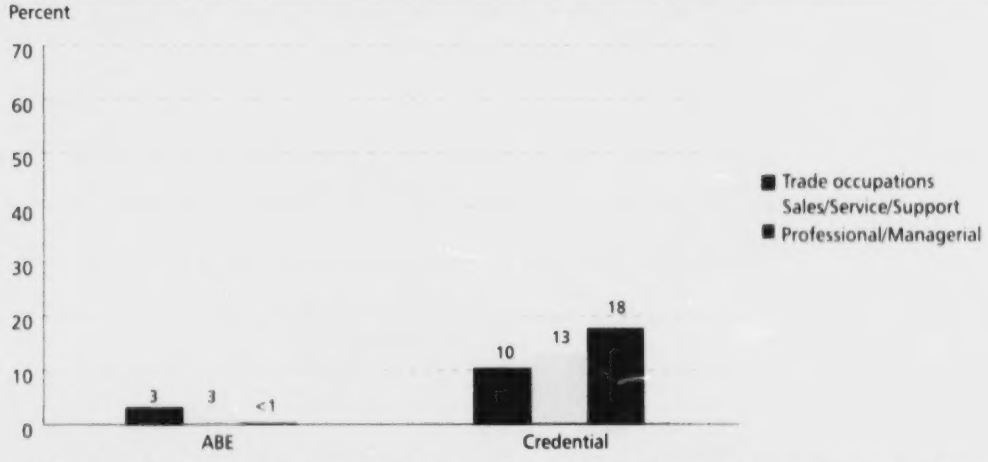
Figure 10.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by race/ethnicity: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

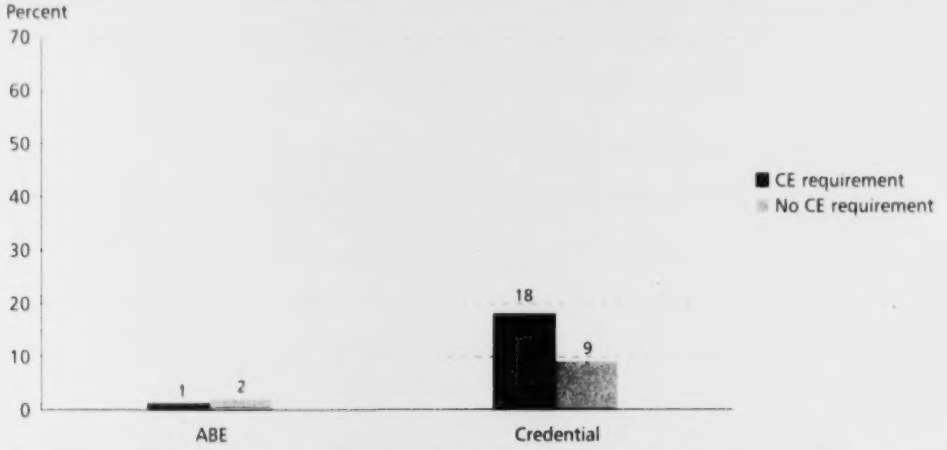
Figure 11.—Percent of employed adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by occupation group: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

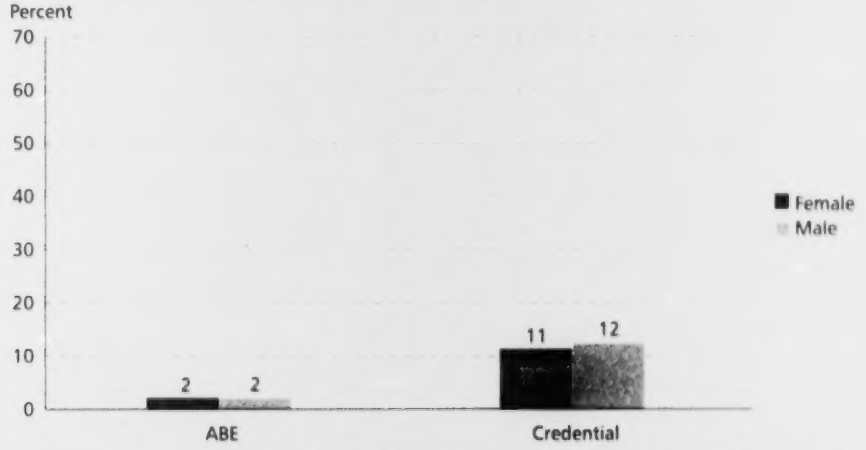
Figure 12.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by whether adult has a continuing education (CE) requirement: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

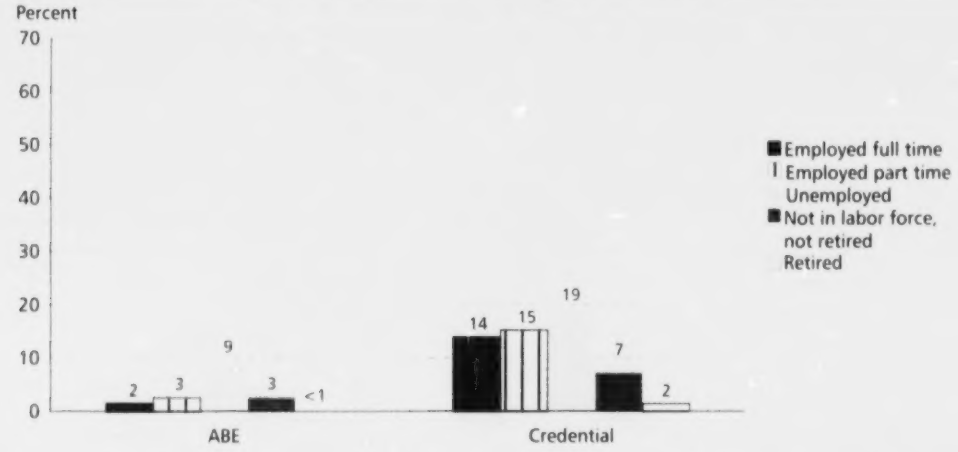
Figure 13.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by sex: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Figure 14.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by labor force status: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

1991 to 1999), or the fact that the earlier study focused on federally funded ABE programs, which might target particular adults such as women on welfare and the unemployed.

In contrast to adult education in general, ABE participation rates are highest among the youngest adults; participation rates drop precipitously after age 24, from 9 percent to no more than 2 percent (figure 15). This finding is not new. The National Evaluation of Adult Education Programs found that adults in those programs tend to be relatively young (Development Associates 1993). Previous analyses of the 1995 NHES Adult Education Survey also found that participation in these programs declines with age (Kim, Collins, and Stowe 1997). Ironically, older adults have lower levels of educational attainment than younger adults, suggesting that older adults should have a greater need for basic skills education than do younger adults.[18] But as one ages, the economic benefits that one can accrue by acquiring basic skills decline, making such participation less appealing. Moreover, those who are inclined to seek remedial instruction are increasingly likely to have already done so as they age, so that the older an adult gets, the less likely that adult may be to seek basic skills instruction.

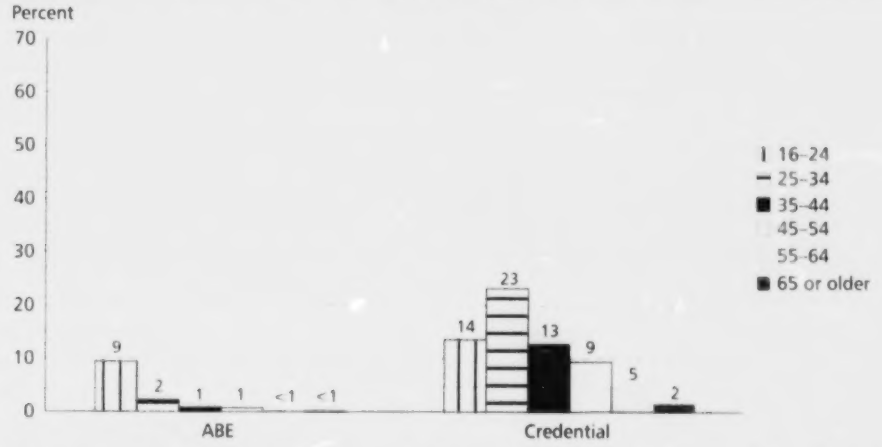
Participation Patterns in Credential Programs

In general, participation rates in credential programs are higher among groups that have higher education levels and lower among groups that have lower education levels. Not counting the youngest adults (among whom full-time credential-seeking was excluded as an adult education activity), participation in credential programs declines with age (figure 15), as the lifetime returns to higher education decline, and those who are interested in higher education achieve their goals.[19] Specifically, participation rates

[18] For example, 88 percent of 25- to 34-year-olds have completed high school, compared to 79 percent of 55- to 64-year-olds and 62 percent of those age 75 or older (U.S. Census Bureau 1999, 170; data are for 1998).

[19] There is one exception to this pattern of decline. Those aged 45–54 participate at the same rate as those aged 35–44.

Figure 15.—Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by age: 1999



NOTE: See table B.4 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

drop from 23 percent for those ages 25–34, to 5 and 2 percent for the two oldest groups of adults. Participation rates do not differ by sex (figure 13), but are higher among Asians (22 percent) and among non-Hispanic Blacks (15 percent) than among non-Hispanic Whites (11 percent) (figure 10). Assuming the higher participation rate among Asians would hold if non-English-speaking Asians had been included in the NHES Adult Education Survey, this racial pattern might reflect the greater cultural value placed on education by many Asian societies (Stevenson and Stigler 1992) or the concentration of Asians in occupational fields that require more education (Barringer, Takeuchi, and Xenos 1990). The higher participation rate for non-Hispanic Blacks may seem counterintuitive, since non-Hispanic Blacks have a lower college enrollment rate than do non-Hispanic Whites.[20] The NHES Adult Education Survey, however, includes vocational training programs within "credential programs." It may be that non-Hispanic Blacks are more likely than non-Hispanic Whites to enroll in vocational training programs, and that this difference accounts for the relatively high participation rate among non-Hispanic Blacks in these credential programs.[21] Also, non-Hispanic Blacks may be more likely than other groups to enroll in credential programs after age 24.

Given the large investment of time and money that is typically involved in completing a credential program, it is not surprising that participation in these programs seems to be linked to participation in the labor force, where education credentials often provide an economic return (Decker, Rice, and Moore 1997). The three groups of adults that are active members of the labor force—full-time workers, part-time workers, and the unemployed—participate at about the same rate (14–19 percent) in credential

[20] In 1999, 39 percent of 18- to 24-year-old non-Hispanic Blacks were enrolled in college, compared to 45 percent of non-Hispanic Whites (Snyder 2001, 216).

[21] There is at least one piece of evidence to suggest that non-Hispanic Blacks are more likely than non-Hispanic Whites to participate in vocational training programs. Among postsecondary students seeking a degree below the baccalaureate level, non-Hispanic Blacks are more likely than all other racial/ethnic groups to seek a vocational (as opposed to academic) sub-baccalaureate degree (Levesque et al. 2000).

programs. All three groups of workers participate at a higher rate than do retirees and other adults who are not in the labor force (figure 14).

Among those who are employed, participation rates in credential programs are higher among those in professional and managerial positions (18 percent) than those in other positions (10 percent for trade workers, 13 percent for sales, service, and support workers) (figure 11). Rates are also higher among those who have continuing education requirements than among those who do not (18 versus 9 percent, respectively; figure 12).

Reflecting the structure of the education system, participation in credential programs is highest among those who have at least some college education (including those with a bachelor's or higher degree), and lowest among those who have not completed high school (figure 9). Over 15 percent of those with at least some college education participate in these programs, compared to 8 percent of those with only a high school diploma, and 3 percent of those who have not completed high school.

As discussed in chapter 1, the profile of 1989–90 undergraduates constructed by Choy, Premo, and Maw (1995) suggests that minorities are as likely as non-Hispanic Whites to be older undergraduates, while women and working adults are more likely than men and nonworking adults to be older undergraduates. The findings in this report replicate the earlier findings for working adults, but not for minorities or women. There are so many differences between these studies, however, that it is difficult to know how to interpret their inconsistencies. In addition to a 10-year time difference, Choy, Premo, and Maw excluded graduate students and undergraduates under age 25, while the current study included graduate students and part-time undergraduates under age 25. The NHES Adult Education Survey also includes vocational training programs within its definition of credential programs; these programs might have a relatively high participation rate among non-Hispanic Blacks (as discussed above) and among men.

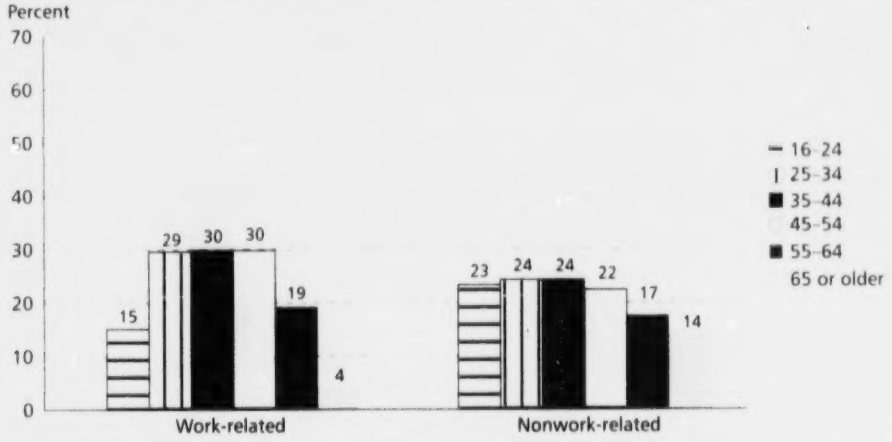
Participation in Work-related and Nonwork-related Courses

Participation patterns in work-related and nonwork-related courses are often similar in their general outline, but differ in their details. The differences in participation patterns that exist between these two types of coursetaking may result in part from employment and economic conditions that affect participation in work-related education; these conditions can lead to greater variability in participation in these courses by certain groups of adults.

First, participation rates in work-related courses are lower for the youngest adults and for the two oldest groups of adults than for mid-aged adults; in nonwork-related courses, participation rates are generally constant except among the oldest group of adults, who participate at a lower rate than all adults younger than age 55 (figure 16). These findings are consistent with past studies of work-related or employer-provided training, which found relatively low rates of participation among adults older than age 54 (Valentine 1997; Frazis et al. 1998); one study also found low rates of participation among young adults (those under age 25; Frazis et al. 1998).

Participation rates also increase with education level and with occupational status for both work-related and nonwork-related courses (figures 17 and 18); the participation rate difference between professional and managerial workers and sales, service, and support workers appears to be particularly large among those taking work-related courses. These findings support other studies that have found that employers are more likely to provide training to better educated and professional workers than to other workers (Lynch and Black 1996; Training Magazine 1997; Frazis et al. 1998).

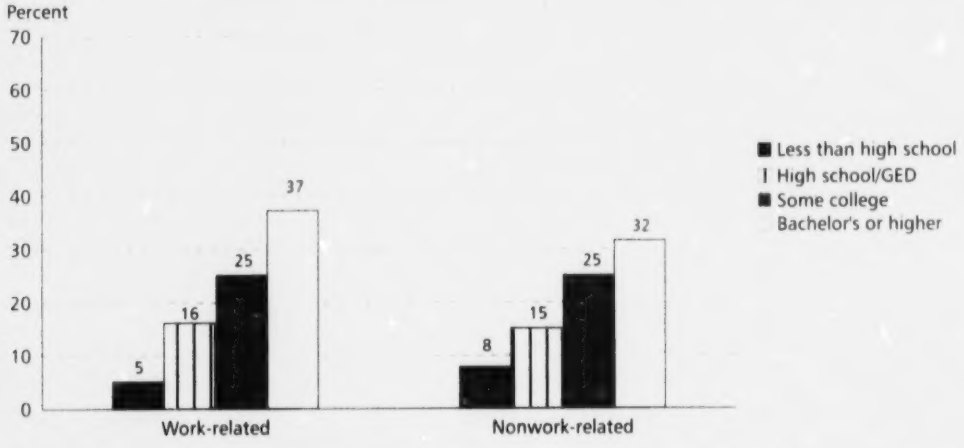
Figure 16.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by age: 1999



NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

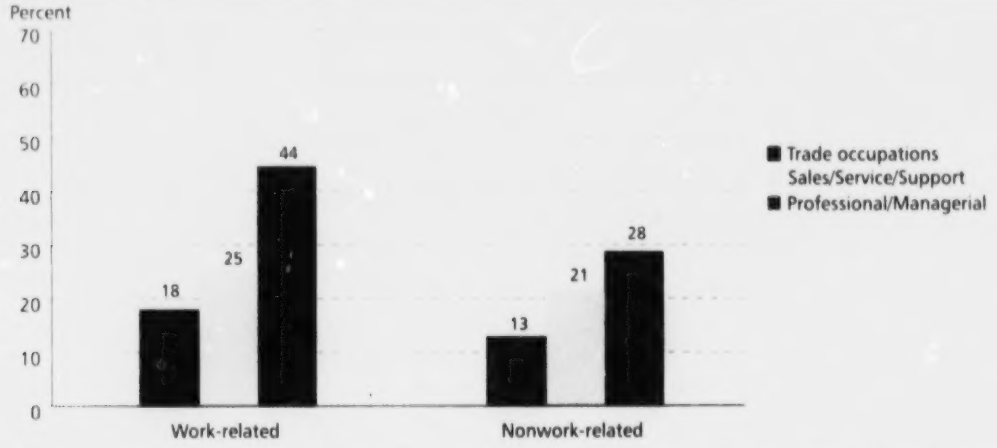
Figure 17.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by education level: 1999



NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Figure 18.—Percent of employed adults who participated in a work-related course and percent who participated in a nonwork-related course, by occupation group: 1999



NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

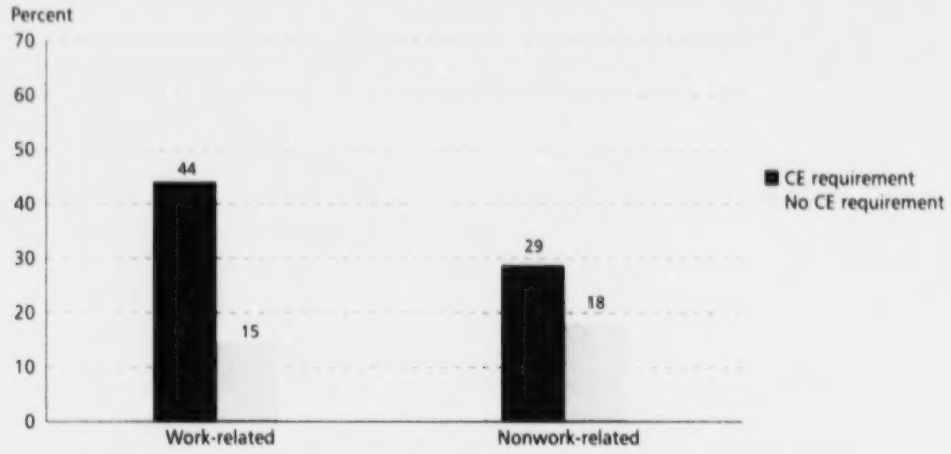
In addition, those who have continuing education requirements are more likely than those without these requirements to participate in both types of coursetaking, but the difference appears to be particularly large for work-related coursetaking, where those with continuing education requirements participate at about three times the rate of those without these requirements (figure 19). These findings suggest that continuing education requirements may have both a direct effect and an indirect effect on coursetaking. That is, having a continuing education requirement may lead directly to coursetaking to meet that requirement, and adults who have a greater interest in formal learning may have both a greater likelihood of entering fields with continuing education requirements and a greater interest in formal coursetaking of all types.

As one might expect, participation patterns by labor force status are very different for work-related and nonwork-related courses (figure 20). For work-related courses, full-time workers participate at higher rates and retirees at lower rates than all other groups. Participation rates in work-related courses are particularly low (about 2 percent) among those who are retired. These findings make intuitive sense, and are consistent with Frazis et al. (1998), who found that full-time workers participated in employer-provided training at higher rates than part-time workers. For nonwork-related courses, there are few differences in participation by labor force status, and those that exist favor part-time workers. Participation rates in these courses are higher among part-time workers than full-time workers, retirees, or other adults who are not in the labor force, suggesting that time constraints (adversely affecting full-time workers), income (adversely affecting nonworkers), or other factors may influence participation in nonwork-related courses.[22]

Participation patterns by race/ethnicity show that for both types of courses, non-Hispanic minorities participate at the same rate as non-Hispanic Whites, while Hispanics participate at a lower rate than

[22] Although the difference in participation rates between part-time workers and the unemployed workers is as large as it is between part-time workers and non-retirees who are out of the labor force, the former difference is not statistically significant because the estimate for the unemployed has a relatively large standard error.

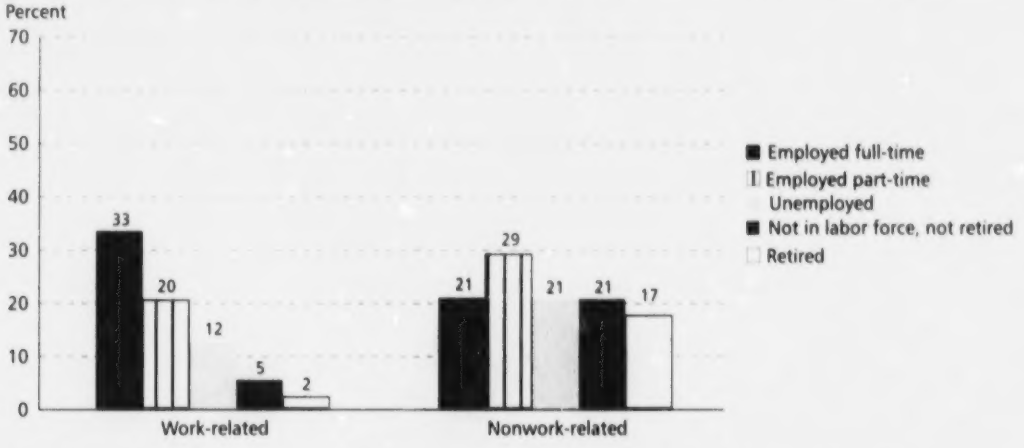
Figure 19.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by whether adult has a continuing education (CE) requirement: 1999



NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Figure 20.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by labor force status: 1999

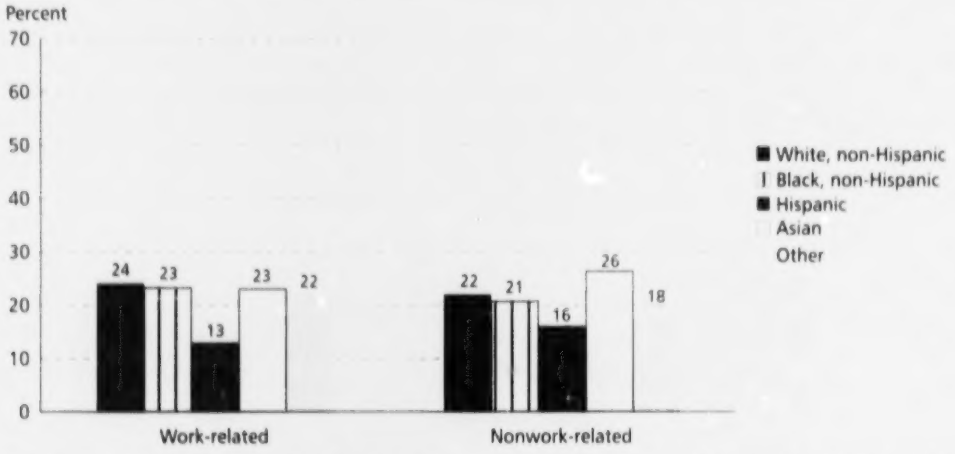


NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

non-Hispanic Whites (figure 21). The only other study with relevant data on this issue did not find differences among racial/ethnic groups in their participation in employer-provided training (Frazis et al. 1998). The lower rate for Hispanics found in the current study may result from the inclusion of work-related courses beyond employer-provided training, as well as from the inclusion of Hispanics who do not speak English. Non-English-speaking Hispanics may be more likely than other racial/ethnic groups to be recent immigrants, poorly educated, and/or to face language barriers that could lower their participation in both work-related and nonwork-related courses (Espenshade and Fu 1997).

Figure 21.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by race/ethnicity: 1999



NOTE: See table B.5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

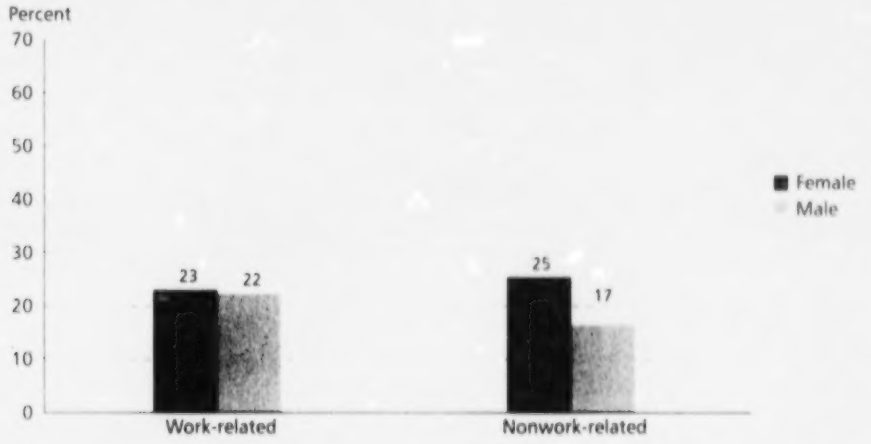
SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Finally, the sex difference in overall participation rates seems to be due to higher rates of participation among women in nonwork-related courses (figure 22). As was found for employer-provided training (Frazis et al. 1998), men and women participate at the *same* rate in work-related courses. One might speculate that women are more likely than men to participate in nonwork-related courses because women participate less often in the labor force, leaving them with more time to pursue nonwork-related coursetaking. However, this argument implies that women should be less likely than men to participate in work-related courses, which does not occur. This participation issue, as well as others raised in this section, is more fully addressed in the next chapter, which focuses on the underlying determinants of participation using multivariate statistical analyses.

Comparison of Participation Patterns

The section above showed the unique participation patterns for each type of adult education activity. This section examines how participation patterns in each of the four most common types of activities compare to the patterns for adult education overall. In other words, this section examines the extent to which the "overall" pattern reflects the pattern of participation in each type of activity. As shown in table 3, overall patterns reflect rather well participation patterns in work-related and nonwork-related

Figure 22.—Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by sex: 1999



NOTE: See table B-5 in appendix B for standard errors. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

courses, and in some cases they reflect the patterns in credential programs. But overall participation patterns do not reflect well the pattern of participation in ABE programs.

In many cases, the participation pattern that characterizes adult education in general masks differences within each type of activity; in some cases, opposite patterns of participation in different activities cancel out when all activities are examined as a group. The overall pattern by age, for example, shows roughly level participation until adults reach their mid-50s, when participation rates begin to decline. This overall pattern results from different age-patterns within each type of learning activity, none of which precisely fits the "overall" model. Participation in work-related courses is lower in the younger years (below age 25) as well as in the later years (age 55 or older), while participation in nonwork-related courses is lower primarily among those age 65 or older. Yet a different pattern characterizes credential and ABE programs, where participation rates are highest for younger adults.

Differences by sex and race/ethnicity are also more complicated than overall participation patterns suggest. The higher rate of participation for women than men arises exclusively from women's higher rate of participation in nonwork-related courses; all other adult education activities are engaged in equally often by men and women. On the other hand, the higher participation rate of Asians in credential programs and the higher participation rate of non-Hispanic Blacks in credential and ABE programs (both relative to non-Hispanic Whites) are not evident in overall patterns of participation. For Hispanics, opposite patterns in different activities cancel out in the aggregate. While participation rates are lower for Hispanics than for non-Hispanic Whites in both work-related and nonwork-related courses, they are higher for Hispanics than for non-Hispanic Whites in ABE programs (and in ESL programs).[23] The equivalent participation rates of non-Hispanic Whites and Hispanics in adult education in general thus result from participation in different activities by each of these racial/ethnic groups.

[23] Seven percent of Hispanics participated in ESL programs, compared to less than 1 percent of non-Hispanic Whites.

Table 3.—Comparison of patterns of participation, by adult characteristic and type of adult education activity: 1999

Characteristics	Overall pattern of participation	Is the participation pattern the same as for overall participation for			
		Work-related courses	Nonwork-related courses	Credential programs	ABE programs
Age	Level until age group 55–64, then declines	Partially (generally lower rate for youngest adults)	Partially (lower rate for age group 65+)	No (rates generally decline after age group 25–34)*	No (higher rate for youngest adults)
Sex	Higher rate for women	No (no difference)	Yes	No (no difference)	No (no difference)
Race/ethnicity (compares non-Hispanic Whites to other groups)	No differences	No (lower rate for Hispanics than non-Hispanic Whites)	No (lower rate for Hispanics than non-Hispanic Whites)	No (higher rates for Asians and non-Hispanic Blacks than non-Hispanic Whites)	No (higher rates for non-Hispanic Blacks and Hispanics than non-Hispanic Whites)
Education level	Increases with higher levels of education	Yes	Yes	Partially (up to "some college" level)	No (generally lower with more education)
Labor force status I (compares FT employed to PT employed and unemployed)	No differences	No (PT employed and unemployed participate at lower rates than FT employed)	Partially (PT employed participate at higher rate than FT employed)	Yes	Yes
Labor force status II (compares FT employed to retired and other not-in-labor-force)	Lower rates for retired and other not-in-labor-force than for FT employed	Yes	No (no differences)	Yes	Partially (retired have lower rate than FT employed)
Occupation group (among employed adults)	Increases with increase in occupational status	Yes	Yes	Partially (professionals have higher rate than others)	No (professionals have lower rate than others)
Continuing education requirement	Higher rate for those with requirement	Yes	Yes	Yes	No (lower rate for those with requirement)

* Those ages 16–24 are not comparable to older age groups because full-time credential participation among those ages 16–24 was excluded from the analysis.
NOTE: See figures in this chapter for specific percentages. ABE stands for adult basic education. FT stands for full-time; PT stands for part-time. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Similarly, there are no differences in overall participation rates among those who are employed full time versus those employed part time or unemployed; this is also true for credential and ABE programs. But work-related and nonwork-related courses show opposite patterns, with the participation rate for work-related courses being higher for full-time workers than for part-time and unemployed workers, and the participation rate for nonwork-related courses being lower for full-time workers than for part-time workers.

Other overall differences are more consistent across activities, if one excludes ABE programs. The higher rates of participation among those with higher levels of education, higher-status jobs, and continuing education requirements all hold for adult education overall, as well as for work-related courses, nonwork-related courses, and credential programs; ABE programs show the *opposite* pattern of participation along each of these dimensions.

Summary

Most of the learning activities in which adults engage are roughly evenly split between courses taken for work and for other reasons, as opposed to targeted programs such as ESL, ABE, and apprenticeships. Credential programs, which typically involve greater time and financial commitments than individual courses, are also taken less often than work-related and nonwork-related courses, although more often than ESL, ABE, or apprenticeship programs.

The increase in participation rates in adult education between 1995 and 1999 cuts across most types of activities, with only ESL programs and work-related courses having no increase in participation over this period. The growth in participation in nonwork-related courses as well as in credential and ABE programs suggests that both labor market factors and factors external to the labor market may be motivating participation increases.

Differences in the patterns of participation in specific types of adult education activities typically reflect the nature of the adults to which specific activities are targeted. Of the four types of adult education activities examined here (ABE, credential, work-related, and nonwork-related), ABE programs have the most unique participation patterns. The participation patterns for these programs are often opposite from those for other activities, with participation rates being higher, for example, for younger adults, less educated adults, and non-Asian minorities (compared to older adults, more educated adults, and non-Hispanic Whites). Participation rates are also higher for younger versus older adults in credential programs, and for Asians and non-Hispanic Blacks than for non-Hispanic Whites. Otherwise, participation patterns in these programs tend to look more like those for adult education in general, with higher rates for more educated adults, those in managerial and professional occupations, and those with continuing education requirements than for those with (respectively) less education, lower status occupations, and no continuing education requirements.

Participation patterns in the two most common learning activities, work-related and nonwork-related courses, are similar in many ways. For both types of courses, participation rates are lower for the oldest adults rather than for younger adults, for Hispanics compared to non-Hispanic Whites, and for those who do not (rather than do) have continuing education requirements. For both types of courses, participation rates increase with increases in education level and occupational status. However, there are also differences in who participates in each type of course. As one might expect given the nature of these activities, participation patterns differ by labor force status; those employed full time participate in work-related courses at a higher rate than other adults, while for nonwork-related courses, those em-

ployed part time participate at a higher rate than full-time employees. Women also participate at a higher rate than men in nonwork-related courses, but at the same rate as men in work-related courses. To help interpret these participation patterns, the next chapter uses multivariate statistics to determine the independent effects of each of these sociodemographic characteristics on participation in work-related courses and in nonwork-related courses.

Chapter 4: The Determinants of Participation

The patterns of participation described in the previous chapter raise a number of questions about the factors that motivate participation in adult education. For example, do those with higher levels of education participate in learning more often because they are more likely to be in occupations that have higher participation rates, or because they are more likely to have continuing education requirements? Do Hispanics participate in work-related courses less often than non-Hispanic Whites because they are less likely to be employed full time? Do women participate in nonwork-related courses at a higher rate than men because they are less likely to be in the labor force?

To answer these questions, this chapter presents the results of a logistic regression analysis using the 1999 NHES Adult Education Survey. Parallel regression equations were run to examine the relationship between the sociodemographic variables discussed in previous chapters and participation in the two most common types of formal adult learning, work-related courses and nonwork-related courses. Because some of the variables of interest apply only to employed adults (i.e., full-time versus part-time employment status and occupation group), two regression models were used for each type of coursetaking. The first model predicted participation among all adults, using the demographic, education level, and continuing education variables discussed in the previous chapters, as well as a modified version of the labor force status variable in which those employed full time and those employed part time were collapsed into one group of "employed" adults; household income was also added as a control variable (table 4).[24] The second model predicted participation among *employed* adults; this model also included the demographic, education level, and continuing education variables from previous chapters, with the addition of the full-time versus part-time distinction from the original labor force variable (hereafter referred to as employment status) and the occupation group variable (excluding the "not employed" category; table 5). Each regression model reveals the relationship between each variable in the model (i.e., each predictor variable) and participation rates (the outcome variable), independently of, after taking into account the other variables in the model.

To help determine which variables mediate the relationship between participation rates and each demographic and labor market characteristic, variables were added to each regression model in a series of steps. The results of the step-wise regression equations (including regression coefficients and standard errors) are presented in tables B.6–B.9 in appendix B. This chapter discusses primarily the results from the final regression models, although the results from the step-wise equations are sometimes used to help interpret the final models. Further details on the regression approach used in this chapter are presented in appendix A.

[24] Income was included in the regression equations so that the effects of other variables could be determined independently from income level. Income was not examined in the previous chapters (and serves only as a control variable in this chapter) because it is related to other variables in the analysis that are under more direct policy control, such as education level and occupation group.

Table 4.—Logistic regression results for the full model predicting the participation of all adults in work-related courses and in nonwork-related courses: 1999

Independent variable	Adjusted odds ratio for: Work-related courses	Nonwork-related courses
Age		
16–24	0.66*	1.26
25–34	0.99	1.05
35–44	(†)	(†)
45–54	0.98	0.86
55–64	0.84	0.68*
65 or older	0.49*	0.51*
Sex		
Female	(†)	(†)
Male	0.76*	0.54*
Race/ethnicity		
White, non-Hispanic	(†)	(†)
Black, non-Hispanic	1.06	1.04
Hispanic	0.63*	0.95
Asian	0.62	0.97
Other	1.14	0.86
Education level		
Less than high school	0.49*	0.56*
High school/GED	(†)	(†)
Some college	1.38*	1.72*
Bachelor's or higher	1.95*	2.32*
Income[1]	0.88*	0.93*
Labor force status (revised)		
Employed	(†)	(†)
Unemployed	0.64	1.39
Retired	0.13*	1.95*
Other not in labor force	0.23*	1.35*
Continuing education (CE) status		
Has CE requirement	2.77*	1.54*
Does not have CE requirement	(†)	(†)

* Significant at $p<0.05$.

† Categories listed in italics were the comparison group for each categorical variable.

[1] Income was included in the regression equation as a continuous variable.

NOTE: The full set of step-wise logistic regression equations for all adults, including intercept terms and R^2 values, is listed in tables B.6 and B.7 in appendix B. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table 5.—Logistic regression results for the full model predicting the participation of employed adults in work-related courses and in nonwork-related courses: 1999

Independent variable	Adjusted odds ratio for: Work-related courses	Nonwork-related courses
Age		
16–24	0.64*	1.03
25–34	0.98	1.07
35–44	(†)	(†)
45–54	0.98	0.88
55–64	0.84	0.66*
65 or older	0.74	0.52*
Sex		
Female	(†)	(†)
Male	0.73*	0.60*
Race/ethnicity		
White, non-Hispanic	(†)	(†)
Black, non-Hispanic	1.03	1.12
Hispanic	0.64*	0.95
Asian	0.61	0.89
Other	1.13	0.86
Education level		
Less than high school	0.47*	0.95
High school/GED	(†)	(†)
Some college	1.31*	1.77*
Bachelor's or higher	1.49*	2.29*
Income[1]	0.89*	0.92*
Employment status		
Employed full time	(†)	(†)
Employed part time	0.54*	1.57*
Occupation group		
Professional and managerial	(†)	(†)
Sales, service, and support	0.72*	0.96
Trades	0.52*	0.78
Continuing education (CE) status		
Has CE requirement	2.51*	1.58*
Does not have CE requirement	(†)	(†)

* Significant at $p<0.05$.

† Categories listed in italics were the comparison group for each categorical variable.

[1] Income was included in the regression equation as a continuous variable.

NOTE: The full set of step-wise logistic regression equations for employed adults, including intercept terms and R^2 values, is listed in tables B.8 and B.9 in appendix B. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Interpreting the Results

Tables 4 and 5 contain the results of the final logistic regression models, expressed as adjusted odds ratios. The predictor variables used in each model are listed on the left-hand side of the tables. For example, age, gender, and race/ethnicity are believed to be related to the probability that an adult participates in work-related and in nonwork-related adult education. Below each variable are the specific groups or categories that it is comprised of (as used in these analyses; age, for example, could be categorized in other ways). The comparison group for each variable is listed in italics; this is the group that all other groups within a particular variable are compared with (so for example, those ages 16–24, 25–34, 45–54, 55–64, and 65 or older are each compared to those ages 35–44).

The center of the table lists the adjusted odds ratios for the final regression models, calculated from the regression results presented in appendix B. An adjusted odds ratio significantly greater than 1.00 (indicated with an asterisk) means that the odds of participation for the selected group is greater than the odds of participation for the comparison group, which in turn means that the probability of participation is greater, or that the rate of participation is greater. Likewise, an adjusted odds ratio significantly less than 1.00 (also indicated with an asterisk) means that the odds of participation, probability of participation, or participation rate, is lower for the selected group than for the comparison group. For a continuous variable, the adjusted odds ratio measures the change in the odds of participation for each unit increase in the variable. (The size of the adjusted odds ratio, however, does not directly translate into differences in probabilities or participation rates. For more information on how to interpret this ratio, see the "Logistic Regression Analysis" section in appendix A.) To maintain consistency with previous chapters, this chapter discusses the regression findings in terms of participation rates.

The final regression models predicted participation in work-related courses fairly well; 21 percent of the variability in participation in work-related courses was accounted for in the equation predicting participation among all adults, and 13 percent of the variability was accounted for in the equation predicting participation among employed adults. The final models did not predict participation in nonwork-related courses as well as in work-related courses; each model for nonwork-related courses accounted for no more than 8 percent of the variability in participation. Nonetheless, in all four final equations, a number of factors were found to be significantly related to participation.

This chapter presents the results of these analyses for each sociodemographic variable discussed in the previous chapter (with labor force status and employment status separated, as discussed above). To help interpret the findings, the results of the regression analyses are compared to the results of the previous chapter, where each variable was examined *without* accounting for other variables. The findings for work-related courses are presented first, followed by the findings for nonwork-related courses.

The reader is cautioned that the analyses presented in this chapter, like those in previous chapters, reveal only whether adult characteristics are *related to* participation rates. These analyses do not provide information on causality. For example, a finding that participation rates are higher among those who are employed full time than among those employed part time *could* have many causal implications. It is possible that being a full-time employee provides more opportunities and/or incentives for participation in (work-related) courses. But it could also be true that those who participate in coursetaking are more likely to be hired for full-time positions as a result of their education, or that an underlying motivational factor drives participation in both coursetaking and the full-time labor force. Although some causal hypotheses are proposed in this chapter to explain the observed relationships, these hypotheses should be interpreted as such—i.e., as hypotheses that require further testing.

The Role of Age

The previous chapter showed that participation in work-related courses increased from age 16–24 to the mid-aged groups, then declined after age 55 (age 55–64 and age 65 or older). The multivariate analysis supports this general pattern of increasing then decreasing participation with age, although the multivariate findings are a bit more complicated. The regression analysis compared the participation rate of "mid-aged" adults (ages 35–44) to those in younger and older age groups. After accounting for all other variables in the regression equation, participation rates were lower for the youngest adults (ages 16–24) and for the oldest adults (age 65 or older) than for mid-aged adults (table 4). The lower participation rate of those ages 55–64 seen in the previous chapter appears to be due to the fact that fewer adults in this age group are in the labor force. (For example, 59 percent of those ages 55–64 were employed, compared to 85 percent of those ages 35–44.) Once labor force status is taken into account, and among *employed* adults, those ages 55–64 were not found to participate in work-related courses at a higher rate than mid-aged adults (table 5).

The relatively low participation rate among the oldest adults (age 65 or older) disappears among employed adults with the same levels of income, suggesting that differences in employment status and income at least partially account for this age-related participation difference. This lack of a decline in participation in work-related coursetaking among employed older adults is inconsistent with human capital theory, which hypothesizes that because older adults have less time to capitalize on the benefits from work-related education, they should be less likely to participate in it. However, the relatively low level of participation in work-related courses among older adults in general may reflect (consistent with human capital theory) a lower level of interest in or ability to enter the labor market among older adults who are not currently employed. Also, the lower participation rate of young adults (ages 16–24)—even after accounting for employment status (full time or part time), occupation group, and continuing education requirements—supports the hypothesis that employers may be less willing to invest in training young workers (presumably because young workers have relatively high turnover rates; Frazis et al. 1998). Alternatively, younger workers may have more current skills than older works, and therefore have less need for work-related coursetaking.

The multivariate analysis was also consistent with the age patterns found in the previous chapter for participation in nonwork-related courses. The previous chapter found that participation in nonwork-related courses did not differ by age except for the two oldest groups of adults (ages 55–64 and age 65 or older), who had relatively low participation rates. After accounting for all other variables in both regression equations, the two oldest age-groups were less likely to participate in nonwork-related courses than were mid-aged adults. Thus, for nonwork-related courses, the lower participation rates of older adults do not appear to be due entirely to their income, education level, or employment characteristics, since their rates are lower even after accounting for these characteristics. These older adults may be deterred from participation in nonwork-related courses mainly by other factors, such as mental or physical health, or a lower level of interest (due to, for example, a lack of offerings targeted to their needs or interests).

The Role of Sex

The previous chapter showed that men and women participate in work-related courses at the same rate. Women participate in these activities at a higher rate than men, however, once labor force status is taken into account. This higher rate of female participation was not evident in the data presented in the previous chapter, perhaps because women's lower rate of participation in the labor force lowers their

overall participation rate in work-related courses. (For example, 68 percent of men are full-time employees, compared to 46 percent of women.

The previous chapter also showed that women participate at a higher rate than men in nonwork-related courses. Even after accounting for labor force status and employment status, women participate in these courses at a higher rate than men. Thus, women's higher rate of participation in nonwork-related courses does not appear to be attributable to their lower level of involvement in the labor force.

It is not clear why women would participate in work-related and nonwork-related courses at a higher rate than men. For example, since the regression analysis included continuing education requirements, the difference in participation in work-related courses does not appear to be due to women's greater concentration in occupations with continuing education requirements (such as teaching). It may be that women are more likely than men to be targeted for coursetaking by employers and other learning providers. Alternatively, women may be more likely than men to seek formal instruction when they wish to learn something new, while men may be more likely than women to use informal or self-directed methods of learning.[25] (This could be called the "asking for directions" hypothesis.)

The Role of Race/Ethnicity

The previous chapter showed that Hispanics participate in both work-related and nonwork-related courses at a lower rate than non-Hispanic Whites. After accounting for the other variables examined in this report, this difference remains for work-related courses. In other words, the lower participation rate of Hispanics in work-related courses does not appear to be due to their lower education level, or to other factors considered here (i.e., age, sex, income, employment and labor force status, occupation group, and continuing education requirements). At least two factors may account for this disparity in participation. First, since Hispanics who do not speak English were included in the NHES Adult Education Survey, it is possible that a language barrier may be preventing some Hispanics from participating in work-related courses.[26] Second, this analysis includes only a very broad control for occupation group. It might be that Hispanic adults are concentrated in specific occupations *within* an occupation group that provide fewer opportunities (or less need) for work-related education.

Hispanics' lower participation rate in nonwork-related courses disappears when other factors are taken into account. Specifically, when age, sex, and education level are taken into account, there is no difference in the participation rates of non-Hispanic Whites and Hispanics in nonwork-related courses. Since Hispanics on average have lower levels of educational attainment than non-Hispanic Whites,[27] it appears that Hispanics' lower level of participation in nonwork-related courses (when other factors are *not* accounted for) may be due to their lower education levels, or to some factor(s) related to education level.

[25] Females are also more likely than males to complete high school (Kaufman et al. 2000) and to enroll in college immediately after high school completion (U.S. Department of Education 2000, 49). Females are also overrepresented among college students; as of 1998, 56 percent of college students were female (Snyder 2001, 202).

[26] Although a language barrier could also affect the participation rates of other groups, such as Asians, this effect would probably not be noticeable in the NHES Adult Education Survey, since those who could not speak either English or Spanish were excluded from the survey.

[27] For example, in 1999, 43 percent of Hispanics did not have a high school diploma, compared to 13 percent of non-Hispanic Whites.

Since the NHES Adult Education Survey included adults who speak Spanish but not English, the findings for nonwork-related courses suggest that language may not be a large barrier to Hispanics' participation in these activities, at least after education level is taken into account. It is possible (although this could not be tested with the NHES data) that language is a greater barrier to participation in work-related courses than in nonwork-related courses because work-related courses may be less likely to be available in Spanish than are nonwork-related courses.

The Role of Education Level

The previous chapter found that for both work-related and nonwork-related courses, participation rates increased as adults' education level increased. In the regression analysis, the participation rate for those with only a high school diploma was compared to the rate for each other education group. For both types of courses, even with other factors taken into account, adults who had not completed high school were found to participate at a lower rate than those who had only a high school diploma, while those with some college and those with at least a bachelor's degree participated at a higher rate than those with only a high school diploma. These results were attenuated somewhat for nonwork-related coursetaking among employed adults. Employed adults with some college and employed adults with a bachelor's or higher degree participated in nonwork-related courses at a higher rate than those who had only a high school diploma, but those who had not completed high school participated at the same rate as those with only a high school diploma.

Nonetheless, the regression models indicate that, in general, education level is positively related to participation in both work-related and nonwork-related courses, regardless of factors such as an adult's age, occupation, labor force status, or income level. This relationship may indicate the effect of an unmeasured variable that is related to both education level and participation. For example, previous research has shown that adults with higher levels of education have stronger literacy skills than those with lower levels of education (Kirsch et al. 1993). Acquired literacy skills, in turn, may make further coursetaking easier or more enjoyable, reducing the effort for formal learning. Alternatively, those who enter school with a stronger ability or motivation to learn may stay in school longer and also seek out learning opportunities outside of school. Finally, fewer courses may be available to or targeted toward adults who have not attended college.

The Role of Labor Force Status and Employment Status

In the previous chapter, it was found that full-time workers participated in work-related courses at a higher rate than all other labor force groups. The multivariate analysis yielded mostly similar results; full-time workers were found to participate in work-related courses at a higher rate than part-time workers, and employed adults participated at a higher rate than those who were retired or otherwise out of the labor force, once other factors were taken into account. It seems apparent (in accordance with human capital theory) that working, particularly full time, would result in more opportunities and more motivation to participate in work-related courses than would working part time or not at all.

The results of the multivariate analysis differed from the previous analysis, however, in one way—after continuing education status was added to the regression model (step 4 in table B.6), unemployed adults ceased to participate in work-related courses at lower rate than employed adults.[28] This pattern of

[28] This finding should be interpreted with caution due to the relatively large standard error associated with the participation rate estimate for the unemployed, which makes it difficult to detect differences between the unemployed and other groups of adults.

findings suggests that at least part of the reason unemployed adults participate in work-related education at a lower rate than employed adults is that unemployed adults are less likely than employed adults to have continuing education requirements.

The previous chapter also found that part-time workers participated in *nonwork-related* courses at a higher rate than either full-time workers or adults who are out of the labor force. The multivariate analysis also found that part-time workers participated in nonwork-related courses at a higher rate than full-time workers, after accounting for other factors. Working part time may provide more opportunities and/or motivation for participating in nonwork-related courses. For example, compared to full-time workers, those employed part time are likely to have more time available to participate in nonwork-related courses.

Those who are not in the labor force are also likely to have more time on their hands for nonwork-related coursetaking. In fact, after accounting for demographics and education level, retired adults were found in the multivariate analysis to participate in nonwork-related courses at a higher rate than employed adults (including both full-time and part-time workers). Why is the relatively high rate of participation among retirees not apparent when other factors are *not* accounted for? Age seems to play a role. Retirees are more likely to be age 65 or older than are employed adults; 74 percent of retired adults are age 65 or older, compared to 2 percent of full-time workers and 8 percent of part-time workers. Non-retired adults who are out of the labor force were also found to participate in nonwork-related courses at a higher rate than employed adults, but only after accounting for continuing education status. (Employed adults were more likely to have continuing education requirements than were non-retired adults who are out of the labor force.) So the best summary of these findings may be that retired adults participate in nonwork-related courses at a higher rate than employed adults *only when adults of the same age are compared*, and those who are otherwise out of the labor force participate at a higher rate than employed adults *only when adults with the same motivational factors (as represented by continuing education requirements) are compared.*[29, 30]

The Role of Occupation Group

The previous chapter showed that participation in both work-related and nonwork-related courses was higher for those in professional and managerial occupations than for those in sales, service, and support occupations and those in trade occupations. After accounting for other variables, this effect remains for work-related courses, but disappears for nonwork-related courses. It is perhaps not surprising that participation in work-related courses remains related to occupation group even after accounting for factors such as education level, employment status, income level, and continuing education requirements, since professional and managerial occupations often involve ongoing professional development. For

[29] The unemployed are also likely to have more time on their hands, but they do not participate in nonwork-related courses at a higher rate than do employed adults; given their labor force condition, the unemployed may choose to spend their time in other ways, such as job seeking or basic skills development.

[30] One might also hypothesize that adults who are not in the labor force are less likely to participate in nonwork-related courses because they might have relatively low income levels. However, after accounting for other factors, there is a negative relationship between income level and participation in nonwork-related courses (see table B.7 in appendix B); in other words, those with less income are *more* likely than those with more income to participate in nonwork-related courses, after accounting for other factors. On the other hand, non-retired adults who are not in the labor force are also older on average than adults who are in the labor force (although they are not as old as retired adults), so *both* age and motivation may be important determinants of participation rates among this group.

example, those in professional and managerial occupations are more likely than those in other occupations to have continuing education requirements.[31] Studies of employer-provided training also have found that this type of training is more likely to be offered to those in professional and supervisory positions than to those in other positions (Training Magazine 1997; Frazis et al. 1998).

On the other hand, there is little reason to expect that occupation should be related to participation in nonwork-related courses, independently of factors such as education level, employment status, and continuing education requirements, so the lack of a relationship between occupation group and participation in nonwork-related courses in the regression analysis seems to make intuitive sense. The occupation groups may differ in their nonwork-related course participation rates when other factors are *not* taken into account because the occupation groups differ in both their likelihood of having continuing education requirements and their educational composition. For example, 60 percent of those in professional and managerial jobs have a bachelor's degree or higher, compared to 16 percent of those in sales, service, and support, and 8 percent of those in manual trades.

The Role of Continuing Education Requirements

Adults who have continuing education requirements were shown in the previous chapter to be more likely than those without such requirements to participate in both work-related courses and nonwork-related courses. This effect remains, for both types of courses, after other variables are taken into account. For obvious reasons, it is not unexpected that continuing education requirements would be related to participation in work-related courses, independent of other factors. It is less clear why continuing education requirements would be related to participation in nonwork-related courses. As discussed chapter 3, one possible reason for this relationship is self-selection; those who enjoy learning may be more likely than other adults to enter occupations that have continuing education requirements and to participate in a wide range of education activities. Another possibility is that participation in continuing education activities may help make adults more aware of coursetaking opportunities in general, or help enhance a general interest in learning, thereby motivating adults' participation in nonwork-related courses, as well as in work-related courses.

Summary

Using regression analysis to look at demographic, education, and labor force variables independently of each other reveals that many of the findings from the previous chapter are the result of interrelationships among these variables. In this summary, the results of the multivariate analysis are used to refine and interpret the findings from the previous chapter. Specifically, the summary poses questions based on the findings in the previous chapter, and answers those questions based on the results of the multivariate analysis presented in this chapter.

First, why do younger adults participate in work-related courses at lower rates than mid-aged adults? The finding that younger adults (ages 16–24) participate in work-related learning at a lower rate than mid-aged adults does not appear to be due to differences in demographics, labor force characteristics, or continuing education status. Human capital theory suggests that employers may be more reluctant to invest in training younger workers rather than older workers. Or perhaps younger adults are

[31] Forty-seven percent of those in professional and managerial occupations have continuing education requirements, compared to 33 percent of those in trades occupations, and 28 percent of those in sales, service, and support occupations.

less likely than older adults to have (or see) the need for further training or education, since they have more recently completed their formal education.

Why do older adults participate in both work-related courses and nonwork-related courses at a lower rate than mid-aged adults? Many factors, particularly labor force status (i.e., whether the adult is employed), appear to contribute to this finding. First, adults age 55–64 are less likely than mid-aged adults to participate in work-related courses because these older adults are less likely to be employed; when labor force status is accounted for, adults age 55–64 participate in work-related courses at the same rate as mid-aged adults. Both labor force status and income seem to help explain the lower participation rate of adults age 65 or older in work-related courses, since this participation rate difference is not evident among employed adults earning equivalent incomes. It is unclear why older adults (age 55 or older) participate in nonwork-related courses at a lower rate than do mid-aged adults, but this difference in participation does not appear to be due to employment or income differences. Other characteristics not measured in this study, such as health or personal interests, may contribute to this lower participation rate among these older adults.

Why do women participate at a higher rate than men in nonwork-related courses? Do women participate in work-related courses at the same rate as men? Women participate in nonwork-related courses at a higher rate than men whether other factors are taken into account or not. When one compares men and women who have the same labor force status, women participate at a higher rate than men in work-related courses as well. Since these differences in participation rates exist even after accounting for employment status, occupation group, and continuing education requirements, they do not appear to be due to the different propensities of men and women to work for pay, or to the nature of their occupations. There could be separate causes for this sex difference for each type of coursetaking. For example, employed women may participate in work-related courses at a higher rate than their male counterparts because companies may be targeting women for advancement opportunities that involve work-related coursetaking. Women may participate in nonwork-related courses at a higher rate than men because these courses may focus on issues that are of greater interest to women than to men. In support of the latter hypothesis, Valentine (1997) found that men were more likely than women to report that courses they were interested in taking were not available. On the other hand, both participation patterns could reflect a greater propensity among women than men to seek formal instruction when in need of knowledge or skill development.

Why do Hispanics participate in both work-related courses and nonwork-related courses at a lower rate than non-Hispanic Whites? Hispanics' lower participation rate in nonwork-related courses appears to be related to their lower average education level; when education level is accounted for, Hispanics and non-Hispanic Whites participate in nonwork-related courses at the same rate. Hispanics' lower participation rate in work-related courses, however, is not related to their education level, employment status, occupation group, income level, or likelihood of having continuing education requirements. There are many other potential causes for this difference, including employer discrimination, language barriers, the concentration of Hispanic workers in specific occupations that receive less training, and other factors that were not taken into account in this analysis. Because work-related learning is presumed to have economic payoffs, this finding raises an equity issue that warrants further exploration.

Why do those employed full time participate in work-related courses at a higher rate than all other adults, and why do those employed part time participate in nonwork-related courses at a higher rate than those employed full time? The regression analysis provides information only on the

participation of full-time workers versus part-time workers, and on employed adults versus the unemployed and those not in the labor market. From this regression analysis, it appears that employed adults participate in work-related courses at a higher rate than adults who are not in the labor force, and that full-time workers participate at a higher rate than part-time workers, regardless of age, sex, race/ethnicity, education level, occupation group, income level, or continuing education status. So those factors cannot (fully) account for this effect. It seems reasonable to conclude that the higher participation rate of both employed adults and full-time workers is motivated by labor market incentives; for both employers and workers, the returns to an investment in employee training are likely to be greater for full-time workers than for any other group.

Participation rates in nonwork-related courses are higher not only among part-time workers (compared to full-time workers), but also, when demographics, education level, income, and continuing education status are taken into account, among those who are retired or otherwise not in the labor force versus those who are employed. These differences in participation rates may arise from the greater amount of free time available to those employed part time compared to those employed full time and to those not in the labor force compared to employed adults. The unemployed also are likely to have more free time than employed adults, but may be less willing than other adults to spend time on activities that are not job related.

Why do those in professional and managerial jobs participate in both work-related and nonwork-related courses at higher rates than those in other jobs? Occupation group differences in participation in nonwork-related courses may be related to differences in education level. When education level (and other characteristics) are taken into account, those in professional and managerial jobs participate in nonwork-related courses at the same rate as other employed adults. Participation in work-related courses, however, is related to occupation group even after accounting for education level and other factors. This finding may reflect two influences—the nature of professional and managerial occupations and employer support. Professional and managerial occupations typically have higher requirements than do other occupations for maintaining and enhancing knowledge and skills. Possibly as a result of this greater need for skill development, employers may be more likely to require and/or provide training to professional and managerial workers than to other workers.

Finally, why do those with higher education levels and those with continuing education requirements participate in both work-related courses and nonwork-related courses at higher rates than (respectively) those with lower education levels and those who do not have continuing education requirements? At least one of these findings is fairly self-evident; having continuing education requirements should increase one's participation in work-related learning relative to those who do not have such requirements. But something else may be going on as well, since those with continuing education requirements are also more likely to participate in nonwork-related courses—regardless of education level, occupation group, labor force status, or income. This finding could reflect the influence of intrinsic and/or extrinsic motivational factors. First, those who enjoy learning (at least with an instructor) may be more likely to both enter occupations that have continuing education requirements and to participate in nonwork-related courses. Second, periodically taking courses to meet one's continuing education requirements may help foster an interest in other types of adult education.

Similar motivational arguments could explain the finding that education level is related to participation in both types of courses, even after accounting for factors such as labor force status, continuing education requirements, occupation group, and income. First, those who enjoy learning may be more likely than those who do not enjoy learning to complete more years of formal schooling *and* to participate in

other formal learning activities. On the other hand, staying in school may instill a greater awareness of the (economic and/or personal) value of education that then leads to greater participation in a wide range of education activities. Finally, opportunity may also be a factor: More courses may be targeted toward adults with higher levels of education, particularly since adults with more education are more likely to have the disposable income needed to pay for coursetaking.

Chapter 5: Conclusions

Participation in adult education is presumed to be a valuable tool for adults to improve their economic and social well-being (Lillard and Tan 1992; Eck 1993; Organization for Economic Cooperation and Development 1997). This view is an extension of the well documented findings concerning the formal education system, where higher levels of education are associated with a range of desirable outcomes for individuals and society, including higher levels of income (Decker, Rice, and Moore 1997), better health (Stacey 1998), and voting and other civic involvement (U.S. Department of Education 1998, 2000). Adult education is also believed to be growing in importance in response to labor market shifts that place a premium on higher level and more flexible job skills.

With that backdrop, it is encouraging to find that participation in adult education is widespread and increasing. In a 1-year period during 1998–99, 46 percent of all adults participated in some type of formal learning activity (excluding "traditional" college enrollments). This represents a significant increase from 1991, when about one-third of adults participated in these activities.

Participation Patterns

To the extent that adult education does help adults function socially and economically, it is important that opportunities for participation are equitable and that adults are motivated to participate in these activities when it is advantageous to do so. This report did not examine adults' opportunities or motivations to participate; instead, the report examined participation rates, which largely reflect the impact of these two factors. From an equity perspective, the good news is that participation rates among most minority groups equals or exceeds that of non-Hispanic Whites. Although non-Hispanic Blacks had a lower rate of participation than non-Hispanic Whites in earlier years, in 1999 these groups participated in adult education at the same rate. Furthermore, women participate at rates that equal or exceed those of men.

In many cases, however, the highly educated and high status groups that have been the traditional beneficiaries of adult education and training remain the main beneficiaries today. Hispanics, those with lower levels of education or lower status jobs, and part-time employees all have relatively low rates of participation in work-related coursetaking, an adult education activity that has economic payoffs (Eck 1993). Adults with lower levels of education also are less likely than those with higher levels of education to participate in credential programs and nonwork-related courses (although they participate at a higher rate in adult basic education programs). Hispanics' lower participation rate in work-related courses does not appear to be due to their education level, labor force status, occupation group, or income level; this difference remains even after these factors are accounted for. Language barriers or specific occupational patterns that could not be detected in this study may account for this difference in participation.

Trends

The increase in participation in adult education found in this report is not new (e.g., Kim and Creighton 1999). What *is* new is evidence of the breadth of this increase. Virtually every group of adults examined—almost every age group, both sexes, every race/ethnic group, every education group, every labor force group, and two of three occupation groups—increased their participation in adult education between 1991 and 1999. The mid-aged and professional/managerial adults that did not increase their participation began the decade with relatively high participation rates.

Participation rates also increased for most types of adult education activities, including ABE programs, apprenticeship programs, credential programs, and nonwork-related courses. As discussed in chapter 1, many labor market influences are presumed to be fueling at least some of the demand for adult education. Participation rate increases among part-time and unemployed workers, in particular, may reflect the growing importance of continued learning in the labor market, as these adults may be increasingly using learning to improve their employability. At the same time, the steady rate of participation among those in professional and managerial positions suggests that labor market influences may not be affecting all adults to the same degree.

Other changes suggest that factors in addition to the labor market are driving recent increases in adult education. In particular, increases in participation among the oldest groups of adults, among those who are retired or otherwise out of the labor force, as well as increased rates of participation in courses that are not work-related suggest that broader influences also exist.

Future Research

This report adds to our understanding of participation in adult education, including who participates and why. This report was limited, however, in the variables it examined. Some factors that are known to affect participation, such as employer support for learning, job tenure, and employer size (Hudson 1999; Frazis et al. 1998; Lynch and Black 1996) could not be included in the analysis. An analysis that included these (and additional) variables might find that some of the relationships between participation and adults' demographic and labor force characteristics can be "explained away." For example, it may be that after accounting for the likelihood of receiving employer support, there are no differences in participation in work-related learning by adults in different occupation groups.

Future versions of the NHES Adult Education Survey are being designed to address this need for additional data. These surveys will include improved questions on employer support and encouragement for adult learning, the role of continuing education requirements, and adults' reasons for participating in formal learning activities, as well as new questions about certificates sought through adult learning activities, and employer size. Plans are underway to conduct a more detailed analysis of work-related adult education using these newer data. Meanwhile, whatever is driving participation in adult education, this report has shown that these forces have been gaining in strength. It remains to be seen if this trend will, or can, continue.

Appendix A: Survey Methodology and Data Reliability

The data in this report come from three waves of the Adult Education Survey, conducted as part of the National Household Education Surveys (NHES) Program in 1991, 1995, and 1999. This appendix provides more detail on the technical features of these NHES Adult Education Surveys and on the analyses conducted for this report. Included here is information on survey response rates, data reliability, weighting procedures, variables created for the analyses (i.e., derived variables), statistical testing procedures, and the logistic regression analysis conducted for chapter 4.

Overview of the NHES Adult Education Surveys

The NHES Adult Education Surveys are telephone surveys conducted by the U.S. Department of Education's National Center for Education Statistics (NCES). Data collection for the 1991 NHES Adult Education Survey took place from January through May of 1991. Data collection for the 1995 NHES Adult Education Survey took place from January through April of 1995, and for the 1999 NHES Adult Education Survey, data collection took place from January through April of 1999. When appropriately weighted, the NHES Adult Education Survey samples are nationally representative of all civilian, noninstitutionalized adults in the 50 states and the District of Columbia. The survey samples were selected using random digit dialing (RDD) methods, and the data were collected using computer-assisted telephone interviewing (CATI) technology.

The 1991, 1995, and 1999 NHES Adult Education Surveys were conducted with samples of adults age 16 or older (age 17 or older in 1991) who were not enrolled in elementary or secondary school at the time of the survey interview. A set of screening items was administered to a member of the household age 18 or older as part of the larger NHES data collection, to collect information on each household member, identify and select eligible adults within the household (including those living away from home in student housing), and identify participants in adult education. Since one goal of the NHES is to produce reliable estimates for race/ethnicity subdomains (in particular, non-Hispanic Blacks and Hispanics), telephone exchanges were stratified by minority concentration, and high minority exchanges (those where at least 20 percent of persons are non-Hispanic Black or at least 20 percent of persons are Hispanic) were sampled at twice the rate of low minority exchanges. Within-household sampling was designed with the goals of achieving estimates precise enough to measure change in participation in adult education overall, in credential programs, and in career- or job-related courses,[32] and to detect differences in overall participation rates between different racial/ethnic groups. To help meet this goal, in households where an adult was sampled, each adult education participant was assigned a probability of selection greater than the probability assigned to nonparticipants.

With the exception of derived variables, all of the variables used in this report are included on the 1991, 1995, and 1999 NHES Adult Education Survey public use data files. Derived variables are constructed from data in the public use files, and are described later in this appendix. More information about the NHES Adult Education Survey data can be found in the various NHES data file user's manuals (Nolin et al. 2000b; Collins et al. 1996; Brick et al. 1992). These and other NHES technical reports are listed on the NCES Web Site at http://nces.ed.gov/nhes.

[32] Career- or job-related activities constituted one section of the 1995 and 1999 NHES Adult Education Surveys. This survey section is different from the work-related courses discussed in the previous chapters of this report; work-related courses were defined based on respondents' main reason for participating in certain types of learning activities (see chapter 1).

Response Rates

1991 NHES Adult Education Survey. The 1991 NHES screener was completed with 60,314 households. In 9,948 of these households, at least 1 adult was sampled for the NHES Adult Education Survey. The response rate for the screener was 81 percent. The completion rate for the survey was 88 percent. Thus, the overall response rate for the survey was 72 percent (the product of the household screening response rate and the survey completion rate). Item nonresponse rates for the items used in this report ranged from 0 to 19 percent (the latter for whether the respondent was looking for work); most nonresponse rates were below 4 percent. Missing data on sociodemographic variables were imputed using a hot-deck procedure. (See Brick et al. 1992 for more information.)

1995 NHES Adult Education Survey. In the 1995 NHES, screeners were completed with 45,465 households, with a response rate of 73 percent. Of the 23,969 adults sampled for the NHES Adult Education Survey, 80 percent (19,722) completed the interview. Thus, the overall response rate for the survey was 59 percent. Since this does not meet the NCES 70-percent standard for response rates, analyses were conducted to determine if there was a nonresponse bias; results indicated that there was no nonresponse bias. Item nonresponse was very low for most items, falling below 4 percent. For the variables used in this report, only one item had a nonresponse rate above 4 percent; the item used to determine part-time credential status in the adult's third reported credential program applied to only 10 respondents and had 2 missing values. Items with missing data were imputed using a hot-deck procedure. (See Collins et al. 1996 for more information.)

1999 NHES Adult Education Survey. In the 1999 NHES, screeners were completed with 55,929 households, with a response rate of 74.1 percent. Of the 8,114 adults sampled for the NHES Adult Education Survey, 84.1 percent (6,977) completed the interview. Thus, the overall response rate for the survey was 62.3 percent. Since this does not meet the NCES 70-percent standard for response rates, analyses were conducted to determine if there was a nonresponse bias; results indicated that there was no nonresponse bias. Item nonresponse rates for most variables were less than 1 percent. Only two items used in this report had nonresponse rates above 4 percent. One item used to determine part-time or full-time status of credential seekers had a nonresponse rate of 5 percent, and the household income item had a nonresponse rate of 19 percent. Items with missing data were imputed using a hot-deck procedure. (See Nolin et al. 2000a for more information.)

Data Reliability

Estimates produced using data from the NHES Adult Education Surveys are subject to two types of error, nonsampling error and sampling error. Nonsampling errors are errors made in the collection and processing of data. Sampling errors occur because the data are collected from a sample rather than a census of the population of interest.

Nonsampling Errors

Nonsampling error is the term used to describe variations in the estimates of a statistic caused by population coverage limitations and errors in data collection, processing, and reporting procedures. The sources of nonsampling errors are typically problems like unit and item nonresponse, differences in respondents' interpretations of the meaning of questions, response differences related to the particular time the survey was conducted, and mistakes in data preparation.

In general, it is difficult to identify and estimate either the amount of nonsampling error or the bias caused by this error. In the NHES Adult Education Surveys, efforts were made to prevent such errors from occurring and to compensate for them where possible. For instance, during the survey design phase, cognitive laboratory interviews were conducted for the purpose of assessing respondent knowledge of the topics, comprehension of questions and terms, and the sensitivity of items. The design phase for each NHES Adult Education Survey also entailed CATI instrument testing and extensive field testing.

An important source of nonsampling error in telephone surveys is the failure to include persons who do not live in households with telephones. About 5 percent of all adults age 16 and older do not live in households with telephones (Brick 1996). Noncoverage is associated with socioeconomic status, such that persons with lower education and/or lower income levels are more likely to live in households without telephones. In each survey year, estimation procedures and weighting adjustments were used to reduce the bias in the estimates associated with excluding adults who do not live households with telephones. For further information on coverage issues and estimation procedures, see Brick (1996) and Nolin et al. (2000a).

Weighting and Sampling Errors

The sample of telephone households selected for each administration of the NHES survey is just one of many possible samples that could have been selected. Therefore, estimates produced from each of the 1991, 1995, and 1999 samples may differ from estimates that would have been produced from other samples selected for the same survey. This type of variability is called sampling error because it arises from using a sample of households with telephones, rather than all households with telephones.

The variance and its square root, the standard error, are measures of the variability due to sampling in estimates. Standard errors can be used as a measure of the precision expected from a particular sample. The probability that a complete census of the population of interest would differ from the sample estimate by less than 1 standard error is about 68 percent. The chance that the difference would be less than 1.65 standard errors is about 90 percent, and that the difference would be less than 1.96 standard errors, about 95 percent.

To minimize both sampling and nonsampling errors, all of the estimates in this report are based on observations that were weighted using the probabilities of selection of the respondents and other weighting adjustments to account for nonresponse and coverage bias. These weights were developed to make the estimates unbiased and consistent with estimates of national totals obtained by the U.S. Census Bureau. In addition, special procedures for estimating the standard errors of the estimates were used to account for each survey's complex sample design. Complex sample designs result in data that violate some of the assumptions that are required to properly estimate standard errors and thus to assess the statistical significance of results. Frequently, the sampling errors of the estimates from a complex sample design are larger than would be expected if the sample were a simple random sample, as is assumed for traditional statistical testing. To compute approximately unbiased estimates of the standard errors, a form of the jackknife replication method was used to compute the standard errors for all estimates in this report, including estimates of national totals, percentages, and regression parameters.

Standard errors are presented for all of the key estimates in this report. These standard errors can be used to produce confidence intervals. For example, an estimated 45.9 percent of adults participated in adult education in 1999. This figure has an estimated standard error of 0.5. Therefore, a 95 percent

confidence interval for the percentage of adults who participated in adult education in 1999 is 45.9 ± (1.96 x 0.5), or 44.9 to 46.9 percent.

Weights used in this report reflect adjustments for the probability of selection of the household in which the adult resides. Household selection adjustments were then multiplied by four additional factors to make them representative of the adult population: (1) the weight associated with sampling the adult domain in the given household, (2) the weight associated with sampling the adult from among all eligible adults in the household, (3) the adjustment associated with NHES Adult Education Survey nonresponse, and (4) the adjustment associated with raking the person-level weights for the NHES Adult Education Survey to U.S. Census Bureau estimates of the number of adults. This final adjustment can occasionally lead to results that suggest an estimate has a standard error of zero. This occurs for estimates of the total or the proportion in a subgroup, when the subgroup of interest corresponds to a raking cell or a combination of raking cells. The reason for this is that each replicate was raked to the same set of totals, so there is no variation in the replicate estimates in this situation.

Derived Variables

Most of the variables used in this report are available on the 1991, 1995, and 1999 NHES Adult Education Survey public-use data files. A few variables, however, were created specifically for this analysis from the existing variables on the data files. The construction of these derived variables is described in this section. This description uses variable names and response categories from the 1999 NHES Adult Education Survey data file.[33]

Participation in Adult Basic Education

Respondents were counted as participants in adult basic education (BASIC) if they responded "yes" on any of the following variables: BSIMPROV, BSGED, and BSHSEQUV. BSIMPROV indicates participation in classes or tutoring "to improve your basic reading, writing, and mathematics skills." BSGED indicates participation "to prepare to take the general educational development test, or GED." BSHSEQUV indicates participation "in some other high school equivalency program or adult high school program." The BASIC variable differs from the public-use file variable BSPARTIC in that it does not include participation in English as a Second Language (ESL) courses.

Participation in Credential Programs

The indicator of participation in credential programs (CRED) was created by modifying the variable that defines full-time and part-time credential participation (CRPTFT). All respondents who were coded 1 (full-time only), 2 (part-time only), or 3 (both) on CRPTFT were counted as participants on the CRED variable, with one exception. Respondents were *not* counted as participants in credential programs if they were ages 16 to 24 and participated only on a full-time basis in such programs; that is, if the value of AAGE98 was less than 25 and the value of CRPTFT equaled 1 (full-time only).

[33] Minor differences exist in the names and construction of variables from year to year. For details, see the NHES user's manuals (Brick et al. 1992; Collins et al. 1996; Nolin et al. 2000b).

Participation in Courses for Work-related Reasons (Work-related Courses)

The indicator of work-related coursetaking (WREASON) is based on respondents' reason for participating in an adult education activity in the last two sections of the 1995 and 1999 survey instruments. Survey respondents were asked to identify, for each activity engaged in, their main reason for participating. Responses were coded into a number of categories, including to "improve, advance, or keep up to date on current job," "to train for a new job or a new career," "to improve basic reading, writing, or math skills," "to meet a requirement for a diploma, degree, or certificate of completion," "a personal, family, or social reason," or "some other reason." Respondents were coded as 1 on WREASON if they gave either of the reasons "to improve, advance, or keep up to date on current job," or "to train for a new job or a new career;" otherwise, respondents were coded 0 on WREASON. The specific variables used to create this work-related indicator are SASCUR, SARSNEW, WRCSREA, WRRSCUR, and WRRSNEW. This definition of work-related coursetaking differs from that used in most previous NCES reports, which categorized all courses in the "job- or career-related courses" section of the survey as work-related.

Participation in Courses for Nonwork-related Reasons (Nonwork-related Courses)

The indicator of participation in courses for nonwork-related reasons (PREASON) was computed by assigning a value of 1 to any respondent who gave any of the following as a main reason for participating in an adult education activity listed in the last two sections of the 1995 and 1999 survey instruments: "to improve basic reading, writing, or mathematics skills," "to improve communication skills," "to meet a requirement for a diploma, degree, or certificate of completion," "to meet a requirement for a high school diploma or GED," "a personal, family, or social reason," or "some other reason." Otherwise a value of 0 was assigned to PREASON. The variables used to create PREASON were SARSPER, SARSREQ, SARSBAS, SARSOTH, WRRSBAS, WRRSREQ, WRRSPER, and WRRSOTH.

Overall Participation

The indicator of overall participation in adult education (OVERALL) was computed by counting any occurrence of participation in ESL, adult basic education, credential programs, apprenticeships, work-related courses, and nonwork-related courses. The variables used in computing OVERALL are ESLANG, BASIC, APPRENTI, CRED, WREASON, and PREASON. Respondents who had a value of 1 on any of these variables were coded as 1 on OVERALL; otherwise, they were coded as 0.

Labor Force Status

Respondents were categorized into five labor force categories on AELABOR9: employed full time, employed part time, unemployed, retired, and other not-in-labor-force. Variables used in the computation of AELABOR9 were current labor force status (AELABOR2), number of hours worked (PAYHRS), and main activity in the past week (JOBACTY). AELABOR2 has values of 1 = Employed in labor force (worked for pay during the past week), 2 = Unemployed (did not work for pay in the past week and was actively seeking work in the past 4 weeks), or 3 = Not in labor force (did not work for pay in the past week). PAYHRS is a continuous variable indicating the number of hours the respondent worked in the past week. JOBACTY is a variable that records the respondent's main activity in the past week if he/she was not employed or was unemployed. JOBACTY is coded as follows: 1 = Keeping house or caring for children, 2 = Going to school, 3 = Retired, 4 = Unable to work, and 91 = Other reason.

AELABOR9 was computed as follows: Respondents were coded as working full time if they were employed (AELABOR2 = 1) and worked at least 35 hours in the week prior to the interview (PAYHRS >= 35). Respondents were coded as working part time if they were employed (AELABOR2 = 1) and worked fewer than 35 hours in the week prior to the interview (PAYHRS < 35). Respondents were coded as unemployed if they were not working for pay in the week prior to the interview and had been actively seeking work in the previous 4 weeks (AELABOR2 = 2). Respondents were coded as retired if they were not in the labor force in the past week (AELABOR2 = 3) and their main activity was retirement (JOBACTY = 3). Respondents were coded as otherwise not in the labor force if they had not worked in the past week, had not been actively seeking work (AELABOR2 = 3), and their main activity was not retirement (JOBACTY = 1, 2, 4, or 91).

Occupation Group

A new variable for occupation group (OCCUCAT) was created based on respondents' current labor force status (AELABOR2, see description above, under "Labor Force Status") and occupation (FSOC). FSOC contains numerical codes indicating the respondent's occupation. Among those who were currently employed (AELABOR2 = 1), FSOC was recoded into three categories: professional and managerial occupations (if 1 <= FSOC <= 11); sales, service, and support occupations (if FSOC = 12, 13, 14, or 22); and occupations in the manual trades (if 15 <= FSOC <= 21). For those unemployed or not currently in the labor force (AELABOR2 = 2 or 3), OCCUCAT was coded 0.

Statistical Tests

Differences discussed in this report are significant at the 95 percent confidence level or higher; where a lack of difference is noted, the significance of the difference is below this threshold. Differences between estimates were tested using the Student's *t* statistic. This *t* statistic can be used to determine the likelihood that the differences between two independent estimates are larger than would be expected simply due to sampling error. To compare the difference between two percentage estimates, Student's *t* is calculated as:

$$t = \frac{p_1 - p_2}{\sqrt{se_1^2 + se_2^2}}$$

where p_1 and p_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. A *t* statistic of 1.96 or larger corresponds to a confidence level of 95 percent or higher.

As the number of comparisons on the same set of data increases, so does the likelihood that the *t* value for one or more of the comparisons will exceed 1.96 simply due to sampling error. For a single comparison, there is a 5 percent chance that the *t* value will exceed 1.96 due to sampling error. For five tests, the risk of getting at least one *t* value over 1.96 due to sampling error increases to 23 percent. This "risk" or probability of finding a given result by chance is the alpha value. To compensate for the effect of multiple comparisons on alpha values, Bonferroni adjustments were made, where appropriate, to the statistical tests in this report. Bonferroni adjustments essentially deflate the alpha value needed to obtain a given confidence level. Bonferroni adjustment factors are determined by establishing the number of comparisons that are being made for a given set of data or hypothesis. The alpha value for a given level of confidence is then divided by the number of possible comparisons. The resulting alpha value is then used to find the value of the *t* statistic associated with that alpha level of confidence.

Multivariate Analysis

For the multivariate analysis presented in chapter 4, a series of logistic regression equations were developed to predict participation in work-related courses and participation in nonwork-related courses. Logistic regression was used instead of ordinary least-squares (OLS) regression because the dependent variables are dichotomous. The findings from these series of equations are summarized in tables B.6–B.9 in appendix B; the adjusted odds ratios for the final models are listed in tables 4 and 5 in chapter 4.

Multivariate procedures such as logistic regression reveal the relationship between each predictor variable (e.g., age, sex) and the outcome variable (participation), independently of all other variables in the equation. In some cases, variables that appeared to be significant in bivariate tests may no longer be related to the outcome variable in multivariate tests. For example, Hispanics were significantly less likely than non-Hispanic Whites to participate in nonwork-related courses (table B.5); however, in the multivariate analyses, the relationship was no longer significant when all other variables were included in the regression equation (table B.7). In other cases, variables that were not significant in the bivariate tests may become significant in the multivariate tests. For example, there was no significant difference in participation rates of men and women in work-related courses (table B.5); however in the multivariate analyses, women were significantly more likely than men to participate in these courses when all other variables were included in the regression equation (table B.6).

Model Specification Issues

The regression equations in chapter 4 could not use the same set of predictor variables that were used in the bivariate analyses in chapter 3 because two of those variables were colinear. Specifically, the labor force variable included three categories of "not employed" adults (unemployed, retired, and other not-in-the-labor-force) that replicated the "not employed" category in the original occupation group variable. Both of these variables could not be included in the same regression equation. To solve this problem, one option would be to run two regression equations for each dependent variable, one including the labor force variable but not the occupation group variable, and one including the occupation group variable but not the labor force variable. This option eliminates the colinearity problem, but at the expense of model specification; occupation group can no longer be examined independently of full- or part-time employment status, and vice versa.

A second option, the option selected for this report, allows for a more complete specification of the regression equations. In this option, two regression models are again used for each dependent variable (participation in work-related courses and participation in nonwork-related courses). The first model predicts participation among all adults and includes only variables that apply to adults in general, including a modified labor force variable that distinguishes among employed adults (full-time and part-time workers combined) and the different groups of "not employed" adults. The second model predicts participation among only employed adults, and includes the same demographic and education variables used to predict participation in the first model, but substitutes the remaining variables that apply only to employed adults for the labor force variable used in the first model. The first of these variables is an indicator of part-time versus full-time employment status (which captures the part of the original labor force variable that was not included in the first model) and the second is the occupation group variable (which no longer includes a category for "not employed," since the model includes only employed adults). These regression models capture the full set of comparisons made in the bivariate analyses, except that the three groups of "not employed" adults are compared to all employed adults rather than to adults who are employed full time.

Logistic Regression

The logistic regression model takes the following form:

$$log\left[\frac{p}{1-p}\right] = B_0 + B_1x_1 + \ldots + B_kx_k$$

for a regression model with k predictor variables.

The $\frac{p}{1-p}$ in this formula is referred to as an odds. Odds indicate the probability of an event occurring (p), divided by the probability that the event does not occur ($1-p$) (in this case, the probability that an adult participates in work-related courses or in nonwork-related courses divided by the probability that an adult does not participate). The log of the odds is used in logistic regression to convert an inherently nonlinear probability function into a linear logarithmic function. In this model, B_0 represents the intercept, which can be interpreted as the log-odds of the dependent variable when all the predictor variables are zero. The coefficient B_1 represents the increase in the log-odds of the outcome variable accounted for by a one-unit increment in the predictor variable x_1 after adjusting for the effects of (or accounting for) the other predictor variables in the model.

To make the B coefficients more interpretable, they are typically converted into adjusted odds ratios, calculated by exponentiating the coefficient of interest. An *odds ratio*, as the name implies, is the ratio of two odds. This ratio measures the change in the odds that an event will occur for each unit change in a given variable. When the variable is dichotomous, the odds ratio measures the change in the odds that is due to belonging to the selected category versus the comparison category. The *adjusted odds ratio* is an estimate of the odds ratio independently of (or after accounting for) other variables. The ratios listed in tables 4 and 5 in chapter 4 are the adjusted odds ratios for the final logistic regression equations predicting participation in work-related courses and in nonwork-related courses (for all adults and for employed adults, respectively).

An example will help clarify the concepts. The odds that women and men participate in nonwork-related courses can be calculated from table B.5. According to table B.5, 17 percent of men and 25 percent of women participated in nonwork-related courses in 1999. The odds that men participate is calculated as follows: 0.17/(1.00-0.17) = 0.20. Similarly, the odds that women participate is: 0.25/(1.00-0.25) = 0.33. The odds ratio, 0.20/0.33=0.61, measures the change in the odds that an adult participates due to the adult's sex. In this case, the odds that an adult participates are 0.61 times as large for men as they are for women. This can also be expressed as a percent change in the odds, calculated as (odds ratio – 1) x 100. A positive value indicates a percent increase in the odds for the selected group relative to the comparison group, and a negative value indicates a percent decrease in the odds. Thus, one can also say that the odds that adults participate in nonwork-related courses are (0.61-1.00) x 100 = -39, or 39 percent lower for men than for women. This does not mean, however, that men are 0.61 times less likely (or 39 percent less likely) to participate than women are. In this example, the relative probability that men participate is 0.17/0.25 or 0.68, which can be expressed as a percent change in the relative probability, as follows: (relative probability – 1) x 100 = -32 percent. Odds ratios will always overstate the difference in relative probabilities. It is always true, however, that whenever odds ratios are greater than 1, so is the relative probability. Similarly, whenever odds ratios are less than 1, so is the relative probability.

The paragraph above describes unadjusted odds ratios. Table 4 in chapter 4 shows that after accounting for the effects of age, race/ethnicity, education level, and the other predictor variables in the regression

equation summarized in that table, the *adjusted* odds ratio for men versus women is 0.54. In this case, the adjusted odds ratio is slightly lower than the unadjusted odds ratio (0.54 versus 0.61); in other cases, the adjusted ratio could be higher than the unadjusted ratio, or the ratios could be identical, depending on the effects of the other variables in the equation.

The summary statistic for logistic regression, R^2_{LA} (listed in tables B.6–B.9 in appendix B), is designed to be roughly equivalent to the adjusted R^2 in OLS regression. In OLS regression, the R^2 indicates the proportion of total variance in the outcome variable that is explained by the predictor variables; in other words, the reduction in the variance in the outcome variable when the predictor variables are taken into account. The R^2_{LA} coefficient in logistic regression indicates the reduction that occurs in the -2 log likelihood associated with the outcome variable when the predictor variables are taken into account. (The –2 log likelihood is a maximum likelihood estimate of the variance of the outcome variable.) A value of 1.00 means that the -2 log likelihood associated with an outcome variable has decreased 100 percent once all of the variables in the model are taken into account; a value of 0.00 means there was no reduction after accounting for the predictor variables. Looking at the first logistic regression equation in table B.6, the R^2_{LA} value is 0.11. This means that, by accounting for the predictor variables, the -2 log likelihood associated with an adult's participation in work-related courses decreases 11 percent (Menard 1995).

Appendix B: Standard Error and Logistic Regression Tables

Table B.1.—Standard errors for table 1: Estimated number of adults and percentage distribution of adults with each demographic, educational, and labor force characteristic: 1999

Adult characteristic	Estimate	Standard error
Total number of adults[1]	194,625,000	[2]0.0
Age		
16–24	12.0	0.4
25–34	19.4	0.7
35–44	23.3	0.5
45–54	18.1	0.6
55–64	12.4	0.4
65 or older	14.7	0.3
Sex		
Female	52.1	(#)
Male	47.9	(#)
Race/ethnicity		
White, non-Hispanic	73.6	0.3
Black, non-Hispanic	11.4	(#)
Hispanic	10.0	(#)
Asian	2.9	0.3
Other minority	2.2	0.2
Education level		
Less than high school	16.8	0.1
High school or GED	28.5	0.7
Some college	26.7	0.6
Bachelor's or higher	27.9	0.7
Labor force status		
Employed full time	56.7	0.7
Employed part time	11.5	0.4
Unemployed	3.7	0.3
Not in labor force, not retired	15.1	0.5
Retired	13.0	0.5
Occupational group		
Professional/managerial	27.6	0.6
Sales/service/support	24.9	0.6
Trades	15.7	0.7
Not employed	31.8	0.6
Continuing education (CE) status		
Has CE requirement	27.4	0.7
Does not have CE requirement	72.6	0.7

[1] All statistics for population counts are rounded to the nearest 1,000.

[2] Standard errors of zero are a result of the sample weighting process, which raked sample estimates to U.S. Census Bureau estimates. See "Weighting and Sampling Errors" in appendix A for more information.

Standard error is less than 0.05.

NOTE: Percentages may not sum to 100.0 due to rounding. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.2.—Standard errors for figure 1: Percent of adults who participated in adult education: 1991, 1995, and 1999; and for figure 8: Percent of adults who participated in each type of adult education activity: 1995 and 1999

Adult education activity	1991 participation rate		1995 participation rate		1999 participation rate	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total number of adults[1]	181,975,000	500,000	189,576,000	153,000	194,625,000	[2]0.0
Overall (any activity)	33.1	0.7	41.9	0.5	45.9	0.5
Adult basic education	—	—	1.2	0.1	2.0	0.2
Credential program	—	—	8.9	0.2	11.7	0.2
Apprenticeship	—	—	1.1	0.1	1.8	0.2
Work-related course	—	—	21.6	0.3	22.7	0.6
Nonwork-related course	—	—	19.1	0.3	21.2	0.6

— Data not available for 1991.

[1] All statistics for population counts are rounded to the nearest 1,000.

[2] Standard errors of zero are a result of the sample weighting process, which raked sample estimates to U.S. Census Bureau estimates. See "Weighting and Sampling Errors" in appendix A for more information.

NOTE: Percents for individual activities do not sum to overall percent due to participation in multiple activities. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Surveys Program, 1991, 1995, and 1999.

Table B.3.—Percents and standard errors for figures 2–7: Percent of adults who participated in adult education, by age, sex, race/ethnicity, education level, labor force status, and occupation group: 1991, 1995, and 1999

Adult characteristic	1991 participation rate		1995 participation rate		1999 participation rate	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total number[1]	181,975,000	500,000	189,576,000	153,000	194,625,000	[2]0.0
Age						
16–24	33.9	1.4	47.0	1.1	50.7	2.7
25–34	41.5	2.0	53.0	0.9	60.3	2.0
35–44	45.2	2.1	51.0	0.9	51.7	1.7
45–54	32.8	2.2	47.0	1.2	49.5	2.1
55–64	22.4	2.1	28.2	1.1	35.2	2.1
65 or older	10.3	1.2	15.2	1.0	18.7	1.1
Sex						
Female	33.0	1.0	43.7	0.6	48.4	1.0
Male	33.2	1.1	39.8	0.7	43.2	1.1
Race/ethnicity						
White, non-Hispanic	34.2	0.8	43.0	0.5	45.7	0.8
Black, non-Hispanic	26.2	2.2	39.4	1.5	48.3	2.2
Hispanic	31.7	2.6	34.8	1.2	42.5	2.1
Other minorities	33.5	4.3	41.8	2.1	50.7	4.1
Education level						
Less than high school	12.6	1.6	15.8	1.1	22.0	1.7
High school or GED	23.8	1.1	31.6	0.8	35.7	1.4
Some college	41.7	1.7	52.4	0.8	53.6	1.2
Bachelor's or higher	53.6	1.9	60.7	1.0	63.6	1.4
Labor force status						
Employed full time	44.6	1.3	52.8	0.6	53.6	1.2
Employed part time	33.5	1.8	49.4	1.2	55.4	2.1
Unemployed	26.9	3.4	40.9	1.9	47.1	5.2
Not in labor force, not retired	21.9	1.6	27.6	0.9	32.1	1.6
Retired	8.8	1.0	13.7	1.0	19.9	1.0
Occupational group						
Professional/managerial	64.8	2.0	68.1	1.0	66.4	1.6
Sales/service/support	36.2	1.4	50.7	0.8	50.1	1.5
Trades	29.1	2.1	35.8	1.0	38.1	2.0

[1] All statistics for population counts are rounded to the nearest 1,000.

[2] Standard errors of zero are a result of the sample weighting process, which raked sample estimates to U.S. Census Bureau estimates. See "Weighting and Sampling Errors" in appendix A for more information.

NOTE: Percents may not sum to 100.0 due to rounding. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Surveys Program, 1991, 1995, and 1999.

Table B.4.—Standard errors for figures 9–15: Percent of adults who participated in an adult basic education (ABE) program and percent who participated in a credential program, by age, sex, race/ethnicity, education level, labor force status, occupation group, and whether adult has a continuing education requirement: 1999

	ABE participation rate		Credential participation rate	
Adult characteristic	Estimate	Standard error	Estimate	Standard error
Age				
16–24	9.4	1.4	13.6	1.3
25–34	2.2	0.5	23.2	1.3
35–44	0.9	0.3	12.8	1.1
45–54	0.7	0.3	9.4	1.0
55–64	0.4	0.2	5.1	1.0
65 or older	0.3	0.2	1.6	0.4
Sex				
Female	1.8	0.3	11.1	0.6
Male	2.2	0.3	12.3	0.7
Race/ethnicity				
White, non-Hispanic	1.3	0.2	10.8	0.6
Black, non-Hispanic	4.0	0.8	14.7	1.4
Hispanic	4.3	0.7	11.4	1.2
Asian	2.0	1.1	22.4	3.5
Other minority	3.6	2.6	14.7	3.3
Education level				
Less than high school	8.0	1.2	2.6	0.7
High school or GED	1.5	0.3	7.7	0.7
Some college	0.8	0.2	17.7	1.0
Bachelor's or higher	—	—	15.5	0.9
Labor force status				
Employed full time	1.6	0.2	14.0	0.7
Employed part time	2.6	0.7	15.3	1.5
Unemployed	9.4	3.6	18.8	3.6
Not in labor force, not retired	2.7	0.7	7.3	0.9
Retired	0.2	0.2	1.5	0.4
Occupational group				
Professional/managerial	0.2	0.1	17.6	1.0
Sales/service/support	2.6	0.4	13.1	1.1
Trades	3.2	0.7	10.2	1.1
Continuing education (CE) status				
Has CE requirement	1.3	0.3	18.1	1.0
Does not have CE requirement	2.2	0.3	9.3	0.5

— These cells are empty by definition. In the 1999 NHES Adult Education Survey, all college graduates were assumed to have not participated in an ABE program within the past year.

NOTE: Percentages may not sum to 100.0 due to rounding. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education. Among adults ages 16–24, full-time participation in credential programs was not counted as an adult education activity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.5.—Standard errors for figures 16–22: Percent of adults who participated in a work-related course and percent who participated in a nonwork-related course, by age, sex, race/ethnicity, education level, labor force status, occupation group, and whether adult has a continuing education requirement: 1999

	Work-related participation rate		Nonwork-related participation rate	
Adult characteristic	Estimate	Standard error	Estimate	Standard error
Age				
16–24	14.8	1.6	23.0	2.3
25–34	29.3	1.8	24.3	1.5
35–44	29.7	1.4	23.5	1.5
45–54	29.8	1.8	22.1	1.4
55–64	19.0	1.7	17.3	1.5
65 or older	3.9	0.6	14.0	1.1
Sex				
Female	23.0	0.8	25.4	0.8
Male	22.4	0.9	16.6	1.0
Race/ethnicity				
White, non-Hispanic	24.0	0.8	21.9	0.6
Black, non-Hispanic	23.2	1.7	20.6	1.8
Hispanic	13.0	1.4	16.1	1.8
Asian	23.0	3.7	26.3	3.4
Other minority	22.1	4.3	17.5	3.7
Education level				
Less than high school	5.2	0.9	7.9	1.3
High school or GED	16.2	1.0	15.1	1.1
Some college	25.3	1.2	25.2	1.1
Bachelor's or higher	37.3	1.4	31.6	1.2
Labor force status				
Employed full time	33.2	1.0	20.7	0.8
Employed part time	20.3	1.6	28.9	1.7
Unemployed	12.4	2.7	20.5	4.4
Not in labor force, not retired	5.3	0.7	20.5	1.3
Retired	2.1	0.5	17.4	1.3
Occupational group				
Professional/managerial	44.3	1.4	28.4	1.2
Sales/service/support	24.9	1.2	21.2	1.2
Trades	17.6	1.6	12.5	1.2
Continuing education (CE) status				
Has CE requirement	44.1	1.3	28.8	1.4
Does not have CE requirement	14.6	0.7	18.3	0.6

NOTE: Percentages may not sum to 100.0 due to rounding. Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.6.—Step-wise logistic regression results predicting the participation of all adults in work-related courses: 1999

Independent Variable	Step 1 b	Step 1 Standard error	Step 2 b	Step 2 Standard error	Step 3 b	Step 3 Standard error	Step 4 b	Step 4 Standard error
Intercept	5.18 *	0.763	5.81 *	0.756	8.36 *	0.786	7.38 *	0.794
Age								
16–24	-0.70 *	0.141	-0.60 *	0.143	-0.53 *	0.146	-0.42 *	0.149
25–34	-0.07	0.113	(#)	0.111	(#)	0.113	-0.01	0.115
35–44	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
45–54	-0.06	0.120	-0.09	0.122	-0.02	0.124	-0.02	0.129
55–64	-0.49 *	0.138	-0.49 *	0.138	-0.18	0.143	-0.17	0.141
65 or older	-2.20 *	0.199	-2.04 *	0.205	-0.79 *	0.248	-0.72 *	0.249
Sex								
Female	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Male	-0.08	0.075	-0.13	0.077	-0.29 *	0.082	-0.28 *	0.084
Race/ethnicity								
White, non-Hispanic	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Black, non-Hispanic	0.08	0.118	0.23	0.119	0.19	0.127	0.06	0.132
Hispanic	-0.47 *	0.150	-0.38 *	0.148	-0.37 *	0.153	-0.46 *	0.154
Asian	-0.44	0.226	-0.43	0.225	-0.39	0.229	-0.48	0.245
Other	-0.06	0.285	0.10	0.289	0.17	0.292	0.13	0.307
Education level								
Less than high school	-1.04 *	0.202	-0.83 *	0.211	-0.70 *	0.214	-0.71 *	0.214
High school or GED	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Some college	0.52 *	0.103	0.40 *	0.101	0.39 *	0.097	0.32 *	0.095
Bachelor's or higher	1.03 *	0.091	0.80 *	0.088	0.80 *	0.084	0.67 *	0.089
Income[1]			-0.15 *	0.015	-0.13 *	0.017	-0.13 *	0.017
Labor force status								
Employed					(†)	(†)	(†)	(†)
Unemployed					-0.60 *	0.278	-0.45	0.265
Not in labor force, not retired					-2.31 *	0.302	-2.07 *	0.298
Retired					-1.76 *	0.156	-1.48 *	0.157
Continuing education (CE) status								
Has CE requirement							1.02 *	0.079
Does not have CE requirement							(†)	(†)
R^2_{LA}	0.12 *		0.14 *		0.18 *		0.21 *	

* Significant at $p<0.05$.
\# Estimate is between ± 0.05.
† Categories listed in italics were the comparison group for each variable.
[1] Income was included in the regression equation as a continuous variable.
NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.7.—Step-wise logistic regression results predicting the participation of all adults in nonwork-related courses: 1999

	Step 1		Step 2		Step 3		Step 4	
Independent Variable	b	Standard error	b	Standard error	b	Standard error	b	Standard error
Intercept	1.92 *	0.559	2.16 *	0.559	1.78 *	0.662	1.27	0.674
Age								
16–24	0.16	0.162	0.21	0.161	0.19	0.152	0.23	0.151
25–34	0.01	0.120	0.04	0.119	0.04	0.118	0.05	0.119
35–44	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
45–54	-0.12	0.125	-0.13	0.125	-0.15	0.125	-0.15	0.126
55–64	-0.27 *	0.134	-0.27	0.134	-0.39 *	0.145	-0.38 *	0.147
65 or older	-0.42 *	0.122	-0.34 *	0.119	-0.71 *	0.177	-0.67 *	0.177
Sex								
Female	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Male	-0.60 *	0.095	-0.62 *	0.094	-0.61 *	0.094	-0.61 *	0.093
Race/ethnicity								
White, non-Hispanic	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Black, non-Hispanic	0.01	0.116	0.08	0.118	0.08	0.120	0.04	0.118
Hispanic	-0.07	0.162	-0.03	0.165	-0.02	0.167	-0.05	0.167
Asian	-0.01	0.172	-0.01	0.172	-0.01	0.172	-0.03	0.175
Other	-0.18	0.247	-0.12	0.248	-0.13	0.248	-0.15	0.249
Education level								
Less than high school	-0.65 *	0.196	-0.57 *	0.197	-0.59 *	0.192	-0.58 *	0.195
High school or GED	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Some college	0.62 *	0.100	0.56 *	0.100	0.57 *	0.101	0.54 *	0.101
Bachelor's or higher	1.00 *	0.110	0.90 *	0.112	0.90 *	0.114	0.84 *	0.115
Income[1]			-0.06 *	0.015	-0.07 *	0.015	-0.07 *	0.015
Labor force status								
Employed					(†)	(†)	(†)	(†)
Unemployed					0.26	0.314	0.33	0.318
Not in labor force, not retired					0.55 *	0.148	0.67 *	0.144
Retired					0.18	0.104	0.30 *	0.107
Continuing education (CE) status								
Has CE requirement							0.43 *	0.087
Does not have CE requirement							(†)	(†)
R^2_{LA}	0.06 *		0.07 *		0.07 *		0.08 *	

* Significant at $p<0.05$.

† Categories listed in italics were the comparison group for each variable.

[1] Income was included in the regression equation as a continuous variable.

NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.8.—Step-wise logistic regression results predicting the participation of employed adults in work-related courses: 1999

	Step 1		Step 2		Step 3		Step 4		Step 5	
Independent Variable	b	Standard error	b	Standard error	b	Standard error	b	Standard error	b	Standard error
Intercept	3.05 *	0.850	3.74 *	0.860	4.06 *	0.854	4.88 *	0.857	4.54 *	0.865
Age										
16–24	-0.74 *	0.142	-0.66 *	0.144	-0.54 *	0.145	-0.52 *	0.142	-0.44 *	0.144
25–34	-0.06	0.120	-0.01	0.118	-0.01	0.120	-0.01	0.119	-0.02	0.121
35–44	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
45–54	0.04	0.129	-0.01	0.132	-0.02	0.132	-0.02	0.130	-0.02	0.134
55–64	-0.15	0.147	-0.20	0.148	-0.18	0.151	-0.19	0.152	-0.18	0.147
65 or older	-0.64 *	0.266	-0.54	0.284	-0.34	0.285	-0.35	0.287	-0.30	0.297
Sex										
Female	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Male	-0.25 *	0.081	-0.31 *	0.084	-0.40 *	0.086	-0.33 *	0.091	-0.31 *	0.093
Race/ethnicity										
White, non-Hispanic	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Black, non-Hispanic	0.07	0.136	0.21	0.136	0.16	0.136	0.17	0.140	0.03	0.144
Hispanic	-0.48 *	0.169	-0.38 *	0.167	-0.40 *	0.166	-0.36 *	0.165	-0.45 *	0.165
Asian	-0.42	0.244	-0.41	0.242	-0.39	0.245	-0.43	0.244	-0.50	0.259
Other	0.02	0.322	0.17	0.323	0.14	0.327	0.15	0.347	0.12	0.364
Education level										
Less than high school	-0.98 *	0.240	-0.83 *	0.246	-0.82 *	0.242	-0.74 *	0.252	-0.76 *	0.254
High school or GED	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Some college	0.51 *	0.109	0.41 *	0.107	0.43 *	0.109	0.34 *	0.108	0.27 *	0.105
Bachelor's or higher	0.97 *	0.096	0.77 *	0.093	0.78 *	0.093	0.49 *	0.100	0.40 *	0.108
Income[1]			-0.13 *	0.018	-0.13 *	0.019	-0.11 *	0.019	-0.12 *	0.019
Employment status										
Employed full time					(†)	(†)	(†)	(†)	(†)	(†)
Employed part time					-0.64 *	0.116	-0.63 *	0.115	-0.62 *	0.112
Occupation Group										
Professional/managerial							(†)	(†)	(†)	(†)
Sales, service, support							-0.44 *	0.084	-0.33 *	0.086
Trades							-0.68 *	0.133	-0.65 *	0.141
Continuing education (CE) status										
Has CE requirement									0.92 *	0.084
Does not have CE requirement									(†)	(†)
R^2_{LA}	0.07 *		0.08 *		0.09 *		0.10 *		0.13 *	

* Significant at $p<0.05$.

† Categories listed in italics were the comparison group for each variable.

[1] Income was included in the regression equation as a continuous variable.

NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

Table B.9.—Step-wise logistic regression results predicting the participation of employed adults in nonwork-related courses: 1999

	Step 1		Step 2		Step 3		Step 4		Step 5	
Independent Variable	b	Standard error	b	Standard error	b	Standard error	b	Standard error	b	Standard error
Intercept	1.89 *	0.702	2.32 *	0.710	2.14 *	0.717	2.42 *	0.718	2.16 *	0.724
Age										
16–24	0.01	0.158	0.07	0.158	-0.02	0.160	-0.02	0.161	0.03	0.162
25–34	0.03	0.126	0.06	0.125	0.07	0.125	0.08	0.125	0.07	0.126
35–44	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
45–54	-0.11	0.137	-0.14	0.138	-0.13	0.137	-0.13	0.138	-0.13	0.139
55–64	-0.37 *	0.171	-0.40 *	0.171	-0.41 *	0.173	-0.41 *	0.172	-0.41 *	0.174
65 or older	-0.58 *	0.280	-0.51	0.279	-0.66 *	0.284	-0.66 *	0.284	-0.65 *	0.281
Sex										
Female	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Male	-0.59 *	0.105	-0.63 *	0.105	-0.56 *	0.105	-0.52 *	0.109	-0.51 *	0.109
Race/ethnicity										
White, non-Hispanic	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Black, non-Hispanic	0.04	0.143	0.12	0.144	0.16	0.149	0.17	0.149	0.11	0.146
Hispanic	-0.10	0.164	-0.04	0.165	-0.02	0.164	-0.01	0.165	-0.05	0.166
Asian	-0.06	0.220	-0.06	0.222	-0.08	0.223	-0.10	0.222	-0.12	0.226
Other	-0.26	0.345	-0.17	0.344	-0.13	0.347	-0.13	0.347	-0.15	0.351
Education level										
Less than high school	-0.20	0.281	-0.09	0.282	-0.10	0.280	-0.06	0.286	-0.05	0.288
High school or GED	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)
Some college	0.72 *	0.129	0.65 *	0.132	0.63 *	0.133	0.60 *	0.133	0.57 *	0.133
Bachelor's or higher	1.10 *	0.133	0.97 *	0.138	0.97 *	0.139	0.87 *	0.155	0.83 *	0.156
Income[1]			-0.08 *	0.021	-0.09 *	0.021	-0.08 *	0.021	-0.08 *	0.021
Employment status										
Employed full time					(†)	(†)	(†)	(†)	(†)	(†)
Employed part time					0.43 *	0.109	0.43 *	0.109	0.45 *	0.107
Occupation Group										
Professional/managerial							(†)	(†)	(†)	(†)
Sales, service, support							-0.11	0.103	-0.04	0.103
Trades							-0.28	0.160	-0.25	0.158
Continuing education (CE) status										
Has CE requirement									0.46 *	0.097
Does not have CE requirement									(†)	(†)
R^2_{LA}	0.05 *		0.06 *		0.06 *		0.07 *		0.07 *	

* Significant at $p<0.05$.

† Categories listed in italics were the comparison group for each variable.

[1] Income was included in the regression equation as a continuous variable.

NOTE: Adults include civilian, noninstitutionalized individuals age 16 or older who are not enrolled in elementary or secondary education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the National Household Education Surveys Program, 1999.

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